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Auditor General of British Columbia

Infection Control: Essential for a Healthy British Columbia:

Vancouver Coastal Health Authority

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Detailed Report

Background

Infection prevention, surveillance and control programs aim mainly at protecting patients, health care workers and visitors from contracting an illness while in the health care environment. Public Health programs have a similar goal: that of preventing the spread of communicable diseases in the population at large. Data on communicable diseases is available but data on the impact of hospital-acquired infections in British Columbia is very limited, although some health authorities have made attempts to examine the costs of specific organisms. However, studies highlight the enormity of the issue of hospital-acquired (nosocomial) infections (see below).

The Numbers on Health Care Acquired Infection

In New Zealand in 2003, it was estimated that about 10% of patients admitted to hospital will acquire an infection as a result of their hospital stay. A study released by the British National Health Service in the same year found that 9% of the population acquired an infection during a hospital stay and estimated that the cost per patient increased three-fold when the individual contracted a hospital-associated infection.

In the United States, it is estimated that nearly 2 million patients a year get an infection in a health care facility and, of those, about 90,000 die as a result of the infection. More than 70% of the bacteria that cause hospital-acquired infections are resistant to at least one of the drugs most commonly used to treat them. It is estimated that treating hospital-acquired infections accounts for 2% of total hospital costs.

A Canadian survey (reported in 2000) of hospitals with greater than 80 beds found that only 13% of hospitals adequately monitor hospital infections and only 1 in 5 institutions had the staff and procedures necessary to keep infections controlled. The lead author of that report also prepared data for the Romanow Commission. That information indicated that Canadians contract more than 200,000 hospital-acquired infections annually, resulting in 8,500 – 12,000 deaths per year. The direct costs of hospital-acquired infections were estimated to be around $1 billion annually.

While infection prevention, surveillance and control programs have been part of British Columbia health care facilities for a long time, the capacity of such programs has always varied from one facility to another. These differences in capacity and resources were carried into the 2001 reorganization of the British Columbia health care system. At that time, the system was organized into the Provincial Health Services Authority and five geographically defined health authorities: Interior Health, Fraser Health, Northern Health, Vancouver Coastal Health and Vancouver Island Health. Each of the latter five is responsible and accountable for care delivery across the continuum of care (residential care, acute care, mental health, public health and home and community care).

Background

The Provincial Health Services Authority is responsible for specialized provincial health services, such as cardiac surgery, which is delivered in a number of locations within the regional health authorities. As well, the provincial authority operates the following provincial agencies:

- British Columbia Centre for Disease Control
- British Columbia Cancer Agency
- British Columbia Provincial Renal Agency
- British Columbia Transplant Society
- British Columbia Children's Hospital and Sunny Hill Health Centre for Children
- British Columbia Women's Hospital and Health Centre
- Riverview Hospital
- Forensic Psychiatric Services Commission

In the first few years of this realignment, infection control in the health authorities operated as separate programs within facilities or a cluster of facilities, much as they had done before. At the same time, Public Health continued to operate within the Health Act and its regulations for communicable disease control. Not surprisingly, both these factors make it difficult to bring an integrated approach to infection control management across the continuum of care.

Audit Purpose and Scope

The purpose of our audit was to assess whether the health authorities have effective systems for the prevention, surveillance and control of infections across all service delivery responsibilities.

We focused on the Ministry of Health, the Provincial Health Services Authority and the five geographically defined health authorities. Specifically, we wanted to find out whether the Ministry of Health and the Provincial Health Services Authority provide a framework for infection prevention, surveillance and control (see the Provincial Overview); and whether each of the health authorities:

- has a workable plan in place for prevention, surveillance and control of infections;
- is demonstrating best practices for infection prevention, surveillance and control;

- has information system support in place for infection prevention, surveillance and control; and
- is reporting on the status of its infection prevention, surveillance and control efforts and is making continuous improvements.

We did not examine the infection prevention, surveillance and control practices in the B.C. Ambulance Service, physicians' offices or facilities not funded by the health authorities.

We carried out our audit fieldwork from July 2005 to February 2006.

We performed the audit in accordance with assurance standards recommended by the Canadian Institute of Chartered Accountants and accordingly included such tests and other procedures as we considered necessary to obtain sufficient evidence to support our conclusions. In gathering our evidence, we reviewed documents prepared by the health authorities, the Ministry of Health and other agencies and organizations. We also interviewed board members, senior management, managers and physicians in the health authorities, as well as staff within the Ministry of Health.

Vancouver Coastal Health Authority

The Vancouver Coastal Health Authority provides a full range of services to a population of over 1 million people. The authority serves Vancouver, Richmond, the North Shore and Coast Garibaldi (including Sea-to-Sky, Sunshine Coast and Powell River). In addition, through the denominational service agreement with the United Church, the authority also serves the residents of Bella Bella and Bella Coola. It also has a denominational affiliation agreement with Providence Health Care, which is seen as a partner in the delivery of acute and residential care services to the people living in Vancouver. The specialized services offered by Vancouver Coastal Health also serve patients from across the province.

Background

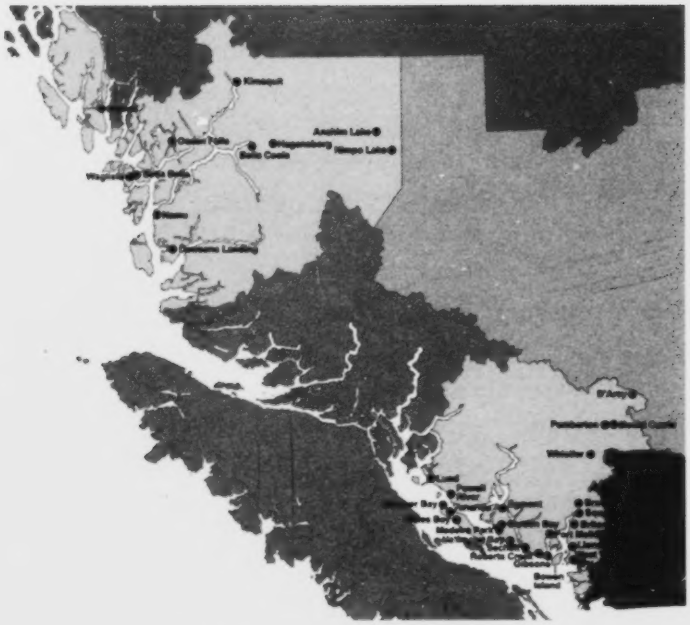
The health authority is a major health partner of the University of British Columbia and partners with other academic institutions to provide training and advanced education to a wide variety of health care professionals. In addition, Vancouver Coastal Health Research Institute is a leading research centre, with almost 1,000 ongoing research projects. There is also a separate Providence Health Care Research Institute.

Overall Conclusion

Vancouver Coastal Health has set clear direction: the establishment of a regional infection control program, although the authority needs to ensure that its program is integrated across all care delivery areas.

The authority has identified which areas it needs to address so it can have a fully functioning regional program. These include a regional surveillance system, adequate information system support, and an increased number of Infection Control Practitioners. Vancouver Coastal Health has committed to providing resources to address these needs over a three-year period.

Background



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Overall Conclusion

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Planning for infection prevention, surveillance and control is being undertaken in the health authority, but not in an integrated way across all areas of care

Vancouver Coastal Health is responsible and accountable for care delivery across the continuum of care (residential care, acute care, mental health, public health, and home and community care). We therefore expected to find that planning for infection prevention, surveillance and control had been integrated across the care continuum.

Conclusion

Vancouver Coastal Health has defined a direction for both communicable disease control and infection control through its Health Service Redesign Plan. However, it does not have an overall integrated plan for infection prevention, surveillance and control across the continuum of care.

Providence Health Care, which functions within an affiliation agreement with Vancouver Coastal Health, has an infection control plan in place for its facilities.

Findings

The authority's Health Service Redesign Plan 2005 – 2008 includes enhancing infection control and communicable disease prevention

The Health Service Redesign Plan of Vancouver Coastal Health lays out the authority's three-year strategic plan and demonstrates the alignment of its strategic direction with the Ministry of Health's Service Plan 2005/06 – 2007/08 and current Performance Agreement. This plan contains strategies for improving communicable disease control and enhancing infectious disease preparedness and response planning. As well, it includes the appointment of a Vice-President, Patient Safety; and within the patient safety umbrella there are strategies specific to infection control.

Set out for each area are objectives, key milestones and dates, key performance indicators and targets, challenges and facilitators to implementation, and financial implications. Exhibit 1 provides an excerpt from the strategies for improving communicable disease control.

Planning for infection prevention, surveillance and control is being undertaken in the health authority, but not in an integrated way across all areas of care

Exhibit 1

Strategies for Improving Communicable Disease Control

IMPROVE COMMUNICABLE DISEASE CONTROL

Descriptions and Milestones

Objectives

Strengthen immunization programs and improve capability to control antimicrobial resistance:

- increase coverage for all routine childhood vaccines
- reduce inappropriate antibiotic use
- increase influenza immunization coverage among health care workers in all settings and residents of care facilities

Key Milestones and Dates

Assess two-year-old immunization coverage from first cross-sectional survey and develop strategies to continue to enhance coverage (implement annually) ..... January 2005

Pilot project of grade two "Do Bugs Need Drugs?*" curriculum in VCH schools..... Spring 2005

Hire a second Educator-Infection Prevention and Control to work with facilities to improve Influenza immunization rates among health care workers 2005

Implement "Do Bugs Need Drugs?*" physician, dentist and pharmacist program 2006/07

Evaluation Method

Key Performance Indicators and Targets

Immunization

- Rate of up-to-date immunization for two-year-olds - increase by five percentage points over previous year or maintain at 80%
- Influenza immunization rates for health care workers in all acute care (AC) and long term care (LTC) facilities - improve toward long term target of 80% for LTC and 60% for AC

Microbial Resistance

- Reduction in antibiotic use
- Reduction or stabilizing trends in development of antibiotic organisms

Evaluation Methodology

Immunization: Evaluation of immunization coverage - annual survey of two-year-olds; number of vaccinations given by Employee Health (acute care) or facilities (long term care)

Microbial Resistance: Measurement of antibiotic use - provincial initiative BCCDC; antibiotic resistant organism trends - Reports from laboratory isolates, BC Medical Microbiologists.

Health Authority Identified Challenges and Facilitators to Implementation

Immunization:

- No regional childhood immunization program in VCH - resources and delivery vary by Health Service Delivery Area
- Opposition to influenza vaccination among some staff, despite ongoing educational efforts.

Microbial Resistance: no funding currently identified for program support materials.

Planning for infection prevention, surveillance and control is being undertaken in the health authority, but not in an integrated way across all areas of care

IMPROVE COMMUNICABLE DISEASE CONTROL (Cont'd)
Facilitators to Implementation
Immunization: Primary Health Care Network Integration Council addressing childhood immunization issues, and the Medical Health Officers advocating for mandatory health care worker vaccination.
Microbial Resistance: Funding being requested.
Financial Capital Implications and Assumptions
Assumption: HSDA budget for immunization are available in addition to costs below.

INITIATIVE DESCRIPTION	PROJECT COSTS 2005/06 (000S)
One New Nursing FTE (Health Care Worker Vaccinations)	$85
"Do Bugs Need Drugs?®" Materials and Advertising Costs	150

Source: Vancouver Coastal Health, Health Service Redesign Plan, 2005/06 to 2007/08

These strategies while very positive are program focused rather than integrated across the continuum of care.

Providence Health Care has an infection control strategic plan in place for its facilities

The strategic plan for infection control was approved in September 2005. It contains:

- a Vision Statement: "We create and sustain a culture in which infection control is integrated into all aspects of care."
- a Mission Statement: "The Infection Control Team is dedicated to the prevention and control of health care-acquired infections in a supportive working environment. Our practices are based on sound scientific principles. We implement our program with structure and authority in collaboration with our local, regional, and provincial partners."
- five goals, each of which includes measures, a number of objectives, specific actions, an assigned lead and a start date. Some objectives and actions carry on into 2006/07 and 2007/08. Exhibit 2 provides an example of a goal from the infection control strategic plan.

Planning for infection prevention, surveillance and control is being undertaken in the health authority, but not in an integrated way across all areas of care

Exhibit 2

Providence Health Care Infection Control Strategic Plan: Goal #1

Goal #1: Providing excellent care and service

Measures: Determine the level of Infection control knowledge by way of a written, random survey administered across Providence Health Care.

Increase surveillance across Providence Health Care.

Identify trends in hand washing compliance at selected high-risk sites.

Objectives 05/06	Actions	Lead (identification removed)	Start	Objectives/Actions 06-07, 07-08
1.1 Develop an appropriate structure integrating infection control (IC) across all PHC. The structure will address leadership, authority, resources, and budget.	1.1.1 Incorporate successful strategies and structures from VRE Control Group. Explore and implement ways to ensure the program is sustained		April	1.1.7 Explore and implement ways to ensure the IC Champion Program is maintained
	1.1.2 Form a structure that incorporates IC team, ICEPT, and Outbreak Management Team. Define the role, responsibilities and relationships between IC and emergency preparedness		Ongoing	
	1.1.3 Clarify roles, reporting, and authority relationships of IC Committee and IC Team. Draft proposal (Done)		May	
	1.1.4 Identify and train Infection Control champions. Define role and responsibilities of IC champions		Ongoing	
	1.1.5 Determine authority required for IC Committee and the IC Team		April	
	1.1.6 Establish IC cost centre and budget		April	

Source: Providence Health Care, Infection Control Strategic Plan, September 2005

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

The Public Health Agency of Canada (formerly Health Canada) has issued a number of guidelines in the area of infection control, which are considered to be "best practice." In addition, guidelines from other agencies, such as the British Columbia Centre for Disease Control and the United States' Center for Disease Prevention and Control, also support best practices.

We expected to see regional standardized, accessible infection control manuals, appropriate structures with accountabilities, educated staff with access to ongoing timely education, workspace conducive to infection management, regular practice monitoring, and active research.

Conclusion

Vancouver Coastal Health is building its infection control program to ensure it demonstrates best practices in infection prevention, surveillance and control. An infection control structure has been put in place supported by additional resources, and a focused approach to practice is underway.

Findings

Infection control/communicable disease standards are accessible to staff, but the infection control manuals of acute care and residential care are not standardized or consistent across the health authority

Infection control standards, policies and procedure manuals provide staff guidance in dealing with specific infections. These manuals are available in hard copy to all departments and programs and online to those departments and programs that have access. However, the manuals are not necessarily consistent across the health authority or kept up-to-date. The manuals that are in place reflect the previous regional health care delivery structure. A new authority-wide manual for acute care is under development, but progress has been slow.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

Any new policies that are developed or existing policies that are revised are done for the authority as a whole. Notification of staff regarding new policies is done differently across the authority, with the exception of posting them on the website. In addition, a storyboard was under development on the intranet, which will include a "What's New" column.

Some residential care facilities within the authority use the B.C. Centre for Disease Control's *Communicable Disease Manual*, which includes a chapter on infection control. Other facilities use an acute care manual. We also heard that some of the community clinics use the guidelines for outpatient clinics, available from the centre.

We were told that staff use the manuals as a resource, as well as accessing the Infection Control Practitioner when questions arise. Physicians interviewed told us that they are aware a manual is available but do not generally use it. Instead, when seeking information, they access an Infection Control Practitioner or another medical colleague familiar with infection issues. The minutes of an infection control meeting also included a discussion about how best to spread the word to physicians about a BCCDC document *Infection Control Guidelines in Physician Offices*. Suggestions made included conducting a special medical round and publishing the guidelines in the *BC Medical Journal*.

For Public Health, the *Communicable Disease Control Manual* is available online from the B.C. Centre for Disease Control, and a hard copy is available in all Public Health offices. Updates or changes to the policies are sent out by the centre and then it is up to each Public Health office to ensure those changes are communicated to staff.

Vancouver Coastal Health is providing focus and resources to infection control in support of meeting best practice standards

In early 2004, a business case for improving infection control resources was prepared by the Regional Infection Control Team and presented to the senior executive team. The business case was approved by the latter, to be phased in over three years. The business case came about as a result of a review conducted post-SARS by the Chief Medical Health Officer at the request of the Chief Executive Officer. That review recommended a regional infection control program and highlighted the need for additional resources.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

A further request for additional Infection Control Practitioner positions came as a result of the SARS Expert Panel Report, which included a new recommended ratio of Infection Control Practitioner to beds. As well, in the fall of 2004, the health authority had participated in the accreditation process through the Canadian Council on Health Services Accreditation, which resulted in some recommendations regarding infection control.

As a result of the changes coming about because of these different reports, aspects of the infection control program were relatively new at the time of our fieldwork.

Infection Control Organization

The Vice-President, Clinical Quality and Safety was appointed in 2004, with responsibility for patient safety, including infection control. Reporting to this position are the Regional Director, Infection Control, who is a medical microbiologist, and the Regional Director, Patient Safety who has administrative responsibilities for the infection control program. Designated site Infection Control Officers (physicians) provide support to site Infection Control Practitioners. These designated officers may be medical microbiologists, pathologists or, in some cases, physicians from another specialty.

At the time of our fieldwork, this structure had only been in place for about a year. Prior to that, infection control was either site or area based. The regional structure supports the development of a consistent approach to standards, monitoring and reporting while providing service delivery at the local level.

Public Health's communicable disease control remains a separate entity from the infection control program, under the direction of the Chief Medical Health Officer for the health authority, who is also a member of the health authority senior executive team.

Providence Health Care, as an affiliate of Vancouver Coastal Health, has its own infection control program and structure, which reports through to the Vice-President, Medical Affairs. It also has two medical microbiologists designated as Infection Control Officers supporting the infection control program.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

A number of groups are key to an infection control program. Some of these are discussed below.

Infection Control Committees

Medical staff have a key role to play in infection control, usually through the medical staff organization and committee structure of the health authority. The Medical Staff Bylaws give the Health Authority Medical Advisory Committee (HAMAC) the responsibility and accountability for the quality of medical care, although the Board of Directors of Vancouver Coastal Health is ultimately accountable for the quality of medical care and the provision of appropriate resources.

At the time of our fieldwork, HAMAC had recently created a subcommittee of its Quality of Care Committee—the Regional Infection Control Committee. This committee was to report to HAMAC via the Quality of Care Committee. The Vice-President, Clinical Quality and Safety chairs the Quality of Care Committee.

In addition to the authority-wide structure, there are Medical Advisory Committees (MACs) for each of the authority's constituent hospitals. Infection Control Committees report to these site MACs, and they in turn report to HAMAC. Membership on these local Infection Control Committees varies by hospital, but generally includes a cross-section of staff.

In addition to the medical committee structure, a Regional Practitioners Committee is focused on program operations such as policies and procedures, education and monitoring. This committee reports to the Infection Control Officer. There is also an Infection Control Interest Group, which includes other agencies such as the B.C. Centre for Disease Control, Women and Children's, Providence Health Care and Public Health.

Providence Health Care has its own Medical Staff Bylaws and organization that has responsibilities and accountabilities similar to those of Vancouver Coastal Health. It also has an Infection Control Standards Committee that is chaired by one of the Infection Control Officers and which reports to the Providence Health Care's Medical Advisory Committee. As well, as noted above Providence Health Care participates in the meetings of the Infection Control Interest Group.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

Vancouver Coastal Health also has two committees focused on communicable diseases. First is the Communicable Disease Policy Committee, which establishes the priorities for communicable disease control in the authority and develops policy. This committee reports to the Chief Medical Health Officer. The committee also ensures that its policies and direction are in keeping with those of the Provincial Communicable Disease Policy Committee. The second committee is the Communicable Disease Operations Committee, which is responsible for implementing and evaluating the communicable disease policies and programs across the region, as well as providing a forum for coordination of planning, education, and information exchange both within and beyond the health sector. The Operations Committee is accountable to the Communicable Disease Policy Committee.

Infection Control Practitioners

The number of certified Infection Control Practitioners required for a comprehensive program has not been firmly established, but the general guideline is 1 for every 150–175 acute care beds and 1 for every 150–250 residential care beds. There are no clear guidelines to indicate the number of practitioners required to support other programs such as community mental health and home care programs. However, it has been noted by a group of infection control experts that there is a need for an infection control practitioner's knowledge and expertise in the community.

The business case of February 2004 indicated that Vancouver Coastal Health required an additional 12.6 full-time-equivalent (FTE) Infection Control Practitioners to be allocated between Acute Care and Residential Care (this included 1 position for contracted residential care beds), if it was to have the personnel in place to meet the guidelines. Providence Health Care's need for Infection Control Practitioners was also part of the business case.

The business case received approval to be phased in over a three-year period. However, in 2005, based on changes in the number and distribution of beds, and a revised minimum recommended ratio of 1 Infection Control Practitioner to every 120 acute care beds (SARS Expert Panel), the authority identified a need for an additional 8.5 positions. Therefore, Vancouver Coastal Health required a total of 30.5 FTE Infection Control Practitioner positions to provide infection control services to its client population.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

As of December 2005, the authority had 16.2 FTE Infection Control Practitioners providing support to its acute care (approximately 2,951 beds including rehabilitation) and owned and operated residential care facilities (approximately 2,700 beds including assisted living and transition). In addition, within Public Health, 2 FTE infection control educators provided support to community health centres and to the non-owned and operated facilities that provide residential care beds.

This level of staffing does not meet the guidelines based on maximum ratios, or provide adequate support to community clinics.

In addition to Infection Control Practitioners, the authority had recently hired an epidemiologist as a key member of the team. The role of the epidemiologist is to establish and maintain a regional surveillance system, conduct analysis and ensure data quality thorough consistency of reporting and use of data definitions. Providence Health Care also has an epidemiologist as a member of its infection control team.

Vancouver Coastal Health has two job descriptions in place, one for Infection Control Practitioners (Lions Gate Hospital, Powell River General Hospital, Richmond Hospital and Squamish Hospital), and one for Senior Infection Control Nurses (Vancouver General Hospital [VGH], UBC Hospital, North Shore Coast Garibaldi, G.F. Strong Rehabilitation Centre, George Pearson Centre and Richmond Health Services). There are some differences in the job responsibilities in that the Senior Infection Control Nurse has a greater role in coordination of the program. Qualifications also differ:

- The Infection Control Practitioner can have a University degree in a relevant health care discipline such as epidemiology or microbiology with a Masters preferred, plus certification (Certification Board for Infection Control) and/or a Certificate of Completion from the Community and Hospital Infection Control Association Canada (CHICA-Canada).
- The Senior Infection Control Nurse may have a Baccalaureate in Nursing with a Masters preferred, plus five years' recent related nursing experience including two years supervisory experience plus certification similar to the Infection Control Practitioner.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

Both position descriptions have approval dates of December 2004. The program also has a Coordinator, Regional Infection Control Initiatives.

Medical Infection Control Officers

The Medical Director, Infection Control has responsibility for the infection control program across the authority, with the exception of Providence Health Care and Public Health. As well, the Medical Director, Infection Control is also the Infection Control Officer for the Vancouver General Hospital. The position description for the Medical Director, Infection Control is generic to all Medical Directors within the health authority. The Medical Director, jointly with the Administrative Director, directs the operations of the program and provides leadership to the interdisciplinary team. Key functions include planning, quality management, staff performance and professional development, policy and procedure development, teaching, education and research.

There are also Infection Control Officers at all sites or cluster of sites (including Providence Health Care) to provide support to the Infection Control Practitioners on a day-to-day basis. An example is the Infection Control Officer who has responsibility for UBC Hospital, G.F. Strong, George Pearson Centre, Purdy Pavilion, Banfield Pavilion and Dogwood Lodge.

The medical microbiologists supported by the laboratory services are integral to the infection control program for the processing and identification of microorganisms, but also for the investigation of potential environmental contamination and air quality monitoring.

The Chief Medical Health Officer and the Medical Health Officers located in the Health Service Delivery Areas (Richmond, North Shore/Coast Garibaldi and Vancouver Community) also provide guidance and advice to the program as needed, although Public Health remains separate from the infection control program. Also within the Vancouver Coastal structure is a Medical Health Officer who is designated as the Medical Director, Communicable Disease Control for the authority. This position is responsible for the surveillance, prevention and control of communicable diseases for the region. The Medical Director, Communicable Disease Control does follow up of any communicable disease occurrence in Vancouver, while in the other HSDAs that is the responsibility of the local Medical Health Officer for the area.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

Occupational Health and Safety/Employee Wellness Department

The Occupation Health and Safety/Employee Wellness Department is not directly part of the infection control program, but works closely with the program because it is responsible for staff health. This involves ensuring that staff are up-to-date with their immunizations and that precautions are in place to protect staff from contracting communicable diseases illnesses (e.g., fitting staff for a special mask referred to as N95, which is used in case of potential airborne pathogens) and taking appropriate steps if staff become infected with an organism such as during an outbreak. Occupational Health and Safety staff also participate on the Infection Control Committees both at the regional level and at the site level.

We were told that Occupational Health and Safety's policies are available to staff on the intranet, as well as in manuals for those areas of the authority with limited intranet access.

We also heard that the line between Occupational Health and Safety and Infection Control Practitioners was blurred on occasion, with the latter giving immunizations at some sites as well as fit-testing for the N95 mask.

Physical Environment

There is evidence that the built environment may influence the incidence of infections in facilities. The built environment refers to the type of rooms, such as: single versus multi-patient (the ability to isolate patients); the location and number of sinks; types of surfaces; ability to separate clean and soiled equipment; and availability of waterless hand-washing stations.

Across the health authority, we heard that the differences in facility age and design impacted the availability and location of sinks for hand washing, the ability to isolate patients and, in some areas, the ability to separate clean and dirty equipment. For example, the tower at Vancouver General Hospital has a total of 108 negative pressure rooms, whereas there are no negative pressure rooms at Squamish General Hospital.

The 2004 Infection Control Annual Report for Powell River and Sechelt notes that the Sechelt Acute Hospital continues to present many infection control challenges. The most problematic at present:

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

- There is only one private room available for isolation.
- Frequent transfers of patients to tertiary centres in Vancouver increase the number of MRSA-positive patients in the hospital.
- Low numbers of sinks, inadequate space for storage of equipment and high occupancy all contribute to increased risk of nosocomial infection.

Emergency rooms across the authority were frequently identified as having no, or limited, ability to isolate patients.

Vancouver Coastal Health has a policy that requires Infection Control Practitioner involvement in construction and renovation projects, but actual inclusion at each stage of a project may not always happen and varies by site. This policy, although dated 2001, is structured similar to the elements as described in the Standards Council of Canada standard "Infection Control During Construction or Renovation of Health Care Facilities." Both documents are based on a 1999 Health Canada guideline "Construction-related Nosocomial Infections in Patients in Health Care Facilities: Decreasing the Risk of Aspergillus, Legionella and Other Infections." (Appendix B provides more detail on the Standards Council of Canada's standard.)

The health authority has installed waterless hand hygiene dispensers throughout its facilities to help promote hand washing by staff and visitors, and to decrease some of the risks created by the lack of sinks in some facilities.

Supplies

The Infection Control Practitioners are responsible for ensuring that the products used to manage infection control are suitable and offer protection to both clients and staff. For example, Infection Control Practitioners are involved in the standardization of skin disinfectants and creams.

We heard from interviewees that gloves, gowns and masks were, for the most part, readily available as needed. Staff working in programs outside of facilities carry appropriate supplies with them.

Vancouver Coastal Health has taken significant steps in building its infection control program to ensure it meets best practice standards

Infection control education for staff after their initial orientation varies across the health authority

Orientation

All staff joining Vancouver Coastal Health attend a regional orientation that has a component on infection control. This session includes information on isolation signage, basics about hand hygiene, and who to contact regarding infection control. In addition staff receive an orientation to their specific work site, including learning about infection control. Workplace Health and Safety is responsible for fit-testing all new staff for the N95 masks and providing general information about its role and services. We were also told that at some sites the Infection Control Practitioner is responsible for fit-testing.

The North Shore/Coast Garibaldi Health Service Delivery Area (HSDA) also provides new staff with an employee handbook, which includes an overview of available infection control resources, how infections spread and how to prevent it, hand washing, and the use of gloves and masks.

There is no formal orientation for new physicians joining the medical staff of Vancouver Coastal Health, although we were told that interns and residents are provided a session on infection control.

Ongoing Education

Ongoing staff education on infection control varies across sites. The topics and approach depend on the Infection Control Practitioner and the needs of the staff. Education on a particular topic is provided both on a formally scheduled basis and on a one-to-one, ad hoc basis. Ad hoc education usually occurs when the Infection Control Practitioner is attending to an issue in a particular department or area. Sometimes the Infection Control Practitioner will be invited to a unit or department meeting to provide education on a particular topic or will make a request to attend a meeting to provide education on an issue. The Infection Control Practitioner also works with staff educators in some areas who in turn educate staff on infection control. Infection Control Practitioners at Providence Health Care provide education to staff in much the same way. Providence Health Care is considering developing "Infection

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Control Champions"—staff who will be provided additional education and will then share their knowledge with others in their work areas and conduct informal monitoring.

The number of hours spent on infection control education/in-services is one of the indicators for the infection control program. As such, each HSDA's Infection Control 2004 annual report includes hours of educational activities provided to staff. The overall report for Vancouver Coastal Health states that they were unable to compare activities in 2004 or even aggregate the data because of the variability in categorizing educational sessions and because some sites did not prospectively record the information. The report also notes that, in the future, an education calendar will be kept on the new regional computer hard drive and used by all Infection Control Practitioners to track hours spent on providing education under specific categories.

Within the Vancouver area (at VGH, UBC, George Pearson Centre, G.F. Strong and Dogwood Lodge), there is an annual update on a variety of topics, including infection control. Attendance is mandatory for staff. However, because most education is ad hoc one-on-one, records of who has received what education about infection control are limited.

"Infection Control Week" in October also provides another opportunity for staff education. This is done through formal education sessions, posters and even quizzes (such as the use of a crossword puzzle, as we saw at one facility).

There are also information and links available on the intranet for staff to access. In addition, Vancouver Coastal Health (in conjunction with experts in infection control, adult education, and information technology from the Provincial Health Services Authority and the Occupational Health and Safety Agency for Health Care in British Columbia) developed an on-line learning module on infection control. Through a grant from the Canadian Nursing Advisory Committee, the module was pilot tested within Vancouver Coastal Health and the Provincial Health Service Authority. The initial feedback was positive and encouraging, but it was felt that further investigation was required.

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Vancouver Coastal Health subsequently received a grant from the Canadian Institute of Health Research to conduct a three-year study of the infection control on-line learning. The key objectives are to:

- ascertain the accessibility, usability, and user satisfaction of the on-line infection control module;
- evaluate the ability of the on-line module to successfully transfer infection control knowledge to health care workers across the health care continuum; and
- evaluate the ability of the on-line infection control module to effect change in self-reported infection control practices among health care workers.

It is anticipated that the information obtained in the project will be valuable when assessing other on-line modules for health care workers.

Public Health Nurses have a more formal approach to education. For example, the Regional Business/In-service Plan for the Sunshine Coast allows for three regional meetings per year, with up to four days of education and up to two days of business. The education is not specified, but the business meetings include charting changes, policy and practice changes, and any new program implementation issues. In addition, there may be education related to specific programs and staff may request permission to attend a specific conference or workshop.

No ongoing education related specifically to infection control has been set for medical staff, although it (like any other topic) can be added to the schedule of medical continuing education sessions. In addition, infection control issues may come up as part of morbidity and mortality rounds, grand rounds, or discussion at a departmental or medical staff meeting. The Medical Health Officers also try to keep medical practitioners up-to-date on emerging pathogens and changes in communicable disease issues through newsletters, electronic communication and medical staff meetings. The physicians we interviewed also indicated that they gain knowledge about issues of infection control through reading (some belong to journal clubs), accessing the Internet, and attending conferences related to their specialty.

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Infection Control Practitioners use a variety of educational opportunities to maintain their knowledge and certification

For Infection Control Practitioners there is no requirement for a set number of hours of continuing education. Ongoing education is usually self-directed: what am I interested in and where do I need to increase my knowledge? Formal educational opportunities include conferences, workshops, and online courses. Informal opportunities include professional association meetings, journal reading and interaction with peers and medical practitioners. The health authority also subscribes to Webber Teleclasses, which are educational sessions on a variety of topics relevant to Infection Control Practitioners. Some examples include: Measuring the Cost of Hospital Infection, Measuring the Value of Hospital Infection Control; Root Cause Analysis for the Infection Control Professional; and C. Difficile: Environmental Survival; The Toilet Bowl Blues.

The business case for increasing infection control resources included a request for additional resources for continuing educational activities—an estimated $8,000 per year for one Infection Control Practitioner educational opportunity per site. Currently the infection control program is considered part of the Laboratory Department, and thus any educational funding must come from the global budget of the laboratory. This, we were told, results in what is under-funding of ongoing professional education.

To maintain certification, Infection Control Practitioners must write and pass a re-certification exam every five years.

Public Health Nurses responsible for immunizations must be re-certified every three years. The certification process involves both an exam and an observation component, from the initial setting up of a clinic through to client assessments, vaccination administration and documenting into the public health information system.

Physicians directly supporting the Infection Control Program, gain knowledge in much the same way as other physicians do: by attending rounds, reading, attending conferences and conducting research.

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Infection control practices are monitored, but methods and degree vary across the health authority

In this audit, we looked at monitoring from two perspectives: surveillance — the ongoing, systematic collection, analysis and interpretation of data for use to improve health outcomes; and the direct observation or audit of practice (such as hand washing or gowning). In addition we looked at the mechanisms the authority has in place for monitoring any third-party contracts that have implications for infection control.

Surveillance

Surveillance within Vancouver Coastal Health generally varies across each HSDA and even by site because it currently depends on the availability, skill and knowledge of the Infection Control Practitioner. The authority is aware of this variation and is taking steps to develop a standardized regional surveillance program.

The recently hired Hospital Epidemiologist, Infection Control is tasked with developing the regional surveillance program. The overall goals of the program will be to:

- establish baseline rates and monitor trends over time;
- detect outbreaks;
- generate and test hypotheses concerning risk factors;
- assess the impact of prevention and control measures; and
- reduce health care-associated infections.

Even though there was no regional surveillance program in place, we still expected surveillance to be conducted across the health authority. In particular, we expected to see surgical surveillance in place across the authority (and if not for all surgeries, at least for some specialties), but even in this area we found variability across the authority. Surgical surveillance is conducted at VGH, Lions Gate Hospital and UBC Hospital, although the types of surgeries monitored may differ.

At VGH, the 2004 Infection Control Annual Report notes that surveillance was performed on selected procedures in thoracic surgery, vascular surgery, neurosurgery, reconstructive orthopaedic surgery, cardiac surgery and pacemaker infections. The infection rates for selected procedures are compared with historical rates and with the U.S. National Nosocomial Infection Surveillance (NNIS)

rates. Surveillance is also conducted in the spinal surgery division, but because of the complexity and diversity of the operations an infection rate is not calculated. However, we were told that the infection control team follows up any increase in the rate.

A 2004 report on the cardiovascular service—written by a medical microbiologist and an Infection Control Practitioner—for the period January 2000 to December 2003 describes the methodology, the NNIS rates, the findings and some discussion points. A 2005 report on the neurosurgery service is structured in a similar manner. Exhibit 3 provides an excerpt from that report for one neurosurgery procedure, showing infection rates in comparison to the NNIS rates. The report also includes a description of the surgery and the methodology used in gathering the data.

Exhibit 3

Neurosurgery (Craniotomy) Infection Rate Report 2000 - 2004

	NNIS			2000			2001			2002			2003			2004		
Procedure	**Risk**	**Proced**	**Rate**	**Proced**	**Cases**	**Rate**	**Proced**	**Cases**	**Rate**	**Proced**	**Cases**	**Rate**	**Proced**	**Cases**	**Rate**	**Proced**	**Cases**	**Rate**
Craniotomy	0	4,717	0.9							120	1	0.8	133	0	0	115	0	0.0
	1	14,864	1.7							223	2	0.9	255	6	2.4	266	2	0.8
	2-3	4,666	2.4							87	2	2.3	71	1	1.4	76	4	5.3
Total Procedure	0-3	24,247	1.7	462	3	0.6	506	6	1.2	430	5	1.2	459	7	1.5	457	6	1.3
Superficial Infection					0	0.0		1	0.2		1	0.2		0	0.0		1	0.2
Deep Infection					3	0.6		5	1.0		4	0.9		7	1.5		5	1.1

Source: VGH Surgical Site Infection Surveillance Report for Neurosurgery for 2000 - 2004

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Notes for Exhibit 3

NNIS risk category and surgical procedures included for the purposes of this report:

1. Craniotomy: For 2000 - 2004; including – Craniotomy (for all reasons – with and without EVD), and brain biopsy with min-craniotomy, and excluding – combined craniotomy and laminectomy, and craniotomy for CSF leak repair.

Method

1. Denominator data was collected for included procedures from the Operating Room Management Information System (ORMIS) database and transferred into Excel spreadsheets. Denominator data represents the number of procedures (not number of patients), as some patients had multiple procedures. Inclusion and exclusion criteria as per above were applied. Duplicates were defined as patients with same day and same time surgery, and then only the most complex procedure was included. Complex spinal procedures were eliminated as per above exclusions, and will only be followed for the spinal service patients and reported upon separately.
2. Numerator (infected case) information was collected by the Infection Control Practitioner using the following: regular rounds of the neurosurgery ward and discussion with staff, review of the OR slate for infected neurosurgery cases, review of the infectious disease case list for infected neurosurgery cases. Case definitions and follow-up as per NNIS guidelines was 30 days, and 1 year if hardware utilized. A check was made that all cases were included in the denominator data.
3. No routine post-discharge follow-up was performed, such as phone follow-up.
4. For comparison purposes, we use the National Infection Surveillance (NNIS) report from Dec. 2004, AJIC, 32, 470-485, for the period from Jan. 1992 to June 2004. This report has published infection rates for the presence of 0, 1, 2, and 3 risk factors. You get one point for each risk factor present. If the case is classified as contaminated or dirty (1 point), if the American society of Anaesthesiologist's (ASA) score is 3 or greater (1 point), or if the duration of surgery is greater than 4 hours for craniotomy (1 point). The NNIS does not break down the infections for these procedures into superficial or deep infections. All of our procedures followed are considered clean, therefore the maximum number of risk factors is 2. ASA and duration of surgery were available for virtually all cases

Most surgery at UBC Hospital is done on a day surgery basis, so surgical surveillance is done post-discharge. This creates some challenges for data collection, both because of the time required for the Infection Control Practitioner to do follow-up phone calls and because of the difficulty in ensuring that physicians or home care nurses who see the patient report any infections that occur.

Surgical surveillance at Lions Gate Hospital had been directed towards hip and knee surgery. This item was included in the 2004 *Infection Control Report* for North Shore Coast Garibaldi, but our interviewees indicated that such surveillance was no longer being done on a regular basis.

Within the context of the regional surveillance program, Vancouver Coastal Health has identified surgical wound infections as a key performance indicator and is in the initial stages of developing a regional surgical site infection surveillance system. As development of the system moves forward, the program is focused on identifying what surgical procedures will be followed, how the cases will be defined, what data will need to be collected,

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what case finding methodology will be used, and how the rates will be tabulated. What type of reporting will be done, to whom and how frequently are yet to be determined. Information system support for the program will also be needed because, as noted in the business case for increased resources, computerized surveillance functions have not been available at two of the four large hospital clusters (Richmond Health Services, North Shore Coast Garibaldi) and only limited at Providence Health Care and Vancouver Acute. The business case estimated it would cost $43,000 for computers and surveillance software to provide up-to-date computerized surveillance functions.

Providence Health Care does not currently conduct surgical site infection surveillance but has identified it in its infection control strategic plan. In July 2005, a business case for surgical site infection surveillance was developed. The preferred option in the business case included building a web-based surveillance system and having surveillance performed by infection control program staff (selected surgeries with both in-hospital and post-discharge follow-up) for a start-up cost of $75,000 and $166,000 annually. However, while funding was pursued to support this preferred option, it was recommended that the web-based surgical site infection software be built to ensure that it could be used for surveillance by surgeons and surgical staff and then subsequently by the Infection Control Practitioners.

As part of the authority's regional surveillance plan, one objective for the fiscal year 2005–2006 was the establishment of standardized surveillance for vancomycin-resistant enterococcus (VRE), methicillin-resistant staphylococcus aureus (MRSA) and Clostridium difficile associated disease (CDAD). This was accomplished, with the development and implementation of a standardized collection of tool and data definitions. The definitions are the same as those of the Canadian Nosocomial Infection Surveillance Program, a national reporting program for these organisms and one in which the authority (through VGH) has been a participant.

In addition, some surveillance conducted is site-specific and some is applicable across the region. For example, there is surveillance for bacteremia (bloodstream infection) at Vancouver General Hospital, as well as syndromic surveillance (a method of following patients with suspected communicable infections from the time of presenting

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symptoms at the start of their hospital admission, throughout their hospital stay). As well, all sites monitor for pulmonary tuberculosis.

Vancouver Coastal Health is also participating in the national patient safety initiative called "Safer Healthcare Now!" which is focused on six targeted interventions. (Each of these has an evidence base indicating that appropriate implementation and practice can lead to reduced mortality and morbidity.) This initiative is patterned on the Institute of Health Improvement's "100,000 Lives" campaign in the U.S.

Of the six targeted interventions, three are connected to infection control: Prevention of Central Line-Associated Bloodstream Infection, Prevention of Surgical Site Infection (selected surgeries), and Prevention of Ventilator-Associated Pneumonia. For each of the interventions, a kit explains the key components, or bundles, of care; the changes that might be made to implement the care requirements; the standardized data to be collected; and the calculations to be completed, analyzed and reported. Involvement in the initiative also requires that baseline data be collected on current infection rates in these areas so that the health authority has some sense of where it is starting.

Public Health's surveillance of communicable diseases is ongoing. It is a regulatory requirement for health care professionals and others to alert Public Health of any client, it has assessed with a disease designated as reportable. Appendix A provides a list of current reportable diseases in British Columbia. Public Health in turn provides surveillance reports to the B.C. Centre for Disease Control, which receives the reports on behalf of the Provincial Health Officer. In addition, Public Health also monitors immunization rates and any adverse events that may occur. This information is also reported to the centre.

Contract Monitoring

Vancouver Coastal Health has contracts with a number of operators of residential care facilities, which outline the expectations of the parties. The template of the contract states that the service provider must meet: all applicable licensing regulations and quality management requirements; provincial standards, legislation and policies (including the Continuing Care Act, the Hospital Act and the *Home and Community Care Policy Manual* or any update of the

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handbook originally published by the Ministry of Health in 1984); and the performance management framework and reporting requirements. The clinical indicators included in the performance management framework focus on care and safety, but there are no indicators specific to infection control. The service provider must also meet any requirements that the authority deems reasonably necessary to address material health and safety risks to the residents.

The contract also requires that the service provider collaborate with the health authority in implementing a quality assurance review process, noting that the review process is mandatory and that the service provider may choose to supplement the process by accreditation with the Canadian Council on Health Services Accreditation (CCHSA) or other similar body.

The service provider must report monthly and/or annually on the indicators outlined. And, although the contract does not require regular reporting on issues of infection surveillance and control, the legislation requires facilities to report any disease outbreaks or occurrences above an incident level normally expected.

Vancouver Coastal Health has two Public Health Infection Control Educators who provide support to the service providers in the non-owned and operated residential care facilities. In addition, it contracts with a provider of housekeeping services for the majority of its facilities, including those of Providence Health Care. Before entering into the contract, the health authority conducted baseline audits of its in-house housekeeping services and used that information in developing the contract. The contract includes a number of sections relevant to infection control. An example is shown in Exhibit 4.

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Exhibit 4

Excerpt Housekeeping Services Contract

Article 2 Services

- The parties agree that the Service levels and Quality Outcomes set out in Schedule 4 are superior to the current service levels maintained by the Health Authority's cleaning operations and will continue to be throughout the Term.
- The Contractor's adherence to the Service Levels and Quality Outcomes outlined in Schedule 4 will be monitored by the Health Authority through observation, monitoring of progress toward targets and Quality Outcomes, periodic audits, microbial testing, analysis of operational reports and investigation of complaints.
- The Contractor and Health Authority shall mutually agree on products used for performance of the Cleaning Services. All approved products shall be of a quality to permit the Contractor to meet the Quality Outcomes set out in the Agreement, including without limitation, Infection Control Guidelines. Any replacement or new product must be approved by the Health Authority.

Article 7 Reporting, Contract Management and Committees

Reporting Requirements

- Unless the Health Authority and Contractor agree otherwise, the Contractor undertakes to comply fully and promptly with the reporting requirements set out in Schedule 6. Schedule 6 requires that (b) The Contractor will provide reports on service delivery measurements including but not limited to:
    - Daily monitoring and periodic written reporting of compliance with performance standards in respect of the Health Authority; and
    - Tracking performance daily by period for the Health Authority.

  (c) The Contractor will provide reasonable ad hoc service level reporting.

Establishment of Committees

- The Contractor and the Health Authority shall jointly establish and maintain throughout the Term, a Cleaning Committee responsible for and representing each Facility and Cluster as well as an Executive Committee.

Cleaning Committee

The responsibilities of the Cleaning Committee includes the following:

- promote information-sharing and problem-solving focusing on Cleaning Service delivery, product quality and cost;
- tracking Quality Outcomes, Service levels, patient and Health Authority satisfaction;
- recommend amendments to Quality Outcomes, including the quality of cleaning specifications in use, and product maintenance/repair standards;
- ensure that standard administrative and training requirements of the Contractor and the Health Authority are identified and met; and
- review Contractor's operating reports.

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Article 9 Security, Access & Confidentiality

Access to Operating Documents

- During the Term of his Agreement, upon reasonable notice, and, in the event of emergency or material risk management response, without notice authorized Health Authority employees and agents and/or external auditors have the right (subject to laws of general application) to examine, audit and take copies of documents pertaining to Cleaning Services provided under this Agreement including:
    - service levels and standards;
    - quality control practices; and
    - adherence to Infection Control Guidelines.

Security and Health Provisions

- Before the Contractor commences providing Cleaning Services, the Health Authority shall make the Contractor aware of the Health Authority's requirements with respect to health, including policies on immunization.
- The Contractor shall require as a condition of employment and otherwise ensure that Contractor Personnel who are required to enter facilities for the purposes of performing Cleaning Services are immunized against communicable diseases in accordance with the most recent Health Canada guidelines for immunization of Health Care Workers and Others Providing Personal Care and Health Care Infection Control Guidelines and other requirements of law. On the first Facility Start Date, and thereafter on each anniversary of such date (and more frequently if required by the Health Authority) the Contractor shall provide the Health Authority an officer's certificate from the Contractor representing and warranting that the Contractor has obtained from each of the Contractor's Personnel engaged in Cleaning Services satisfactory proof of immunization as required.
- The Contractor shall develop, implement, and enforce its own policies and procedures including policies concerning infection control. These polices shall not be inconsistent with the Health Authority's current and future policies.

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Schedule 4 Quality Outcomes

Regular Cleaning Audits

- The Health Authority Representative or his/her appointee will conduct inspection of the work and Quality Outcomes produced by the Contractor, and deficiencies will be reported to the Contractor for immediate correction. In addition, the audit provisions of the Health Authority shall apply as well as monthly routine inspections are to be performed by the Contractor.

Infection Control Guidelines

- "Infection Control Guidelines" means the Canadian Infection Control Guidelines for Housekeeping, published by Health Canada.

Inspections

- The Health Authority will have the right to conduct announced and unannounced inspections at the Facilities and/or at the Contractor's premises to enable the Health Authority to verify that the Cleaning Services are performed in accordance with the terms of this Agreement.
- Joint cleanliness audits ("Joint Audits") of the Facilities will be conducted mutually, by a Health Authority Representative and a Contractor Representative, to determine if the Contractor is meeting the Quality Outcomes required under this Agreement with respect to each Facility.
- The Health Authority will select the Facilities to be audited and may independently conduct audits ("Health Authority Audits") on a random or scheduled basis, at its discretion. No advance notice of a Health Authority Audit is required, but the Health Authority shall communicate in writing to the Contractor the date, time and scope of each Health Authority Audit conducted.

Source: Cleaning Services Agreement Between Vancouver Coastal Health and Aramark Canada Ltd., 2003

Schedule 4 of the contract also contains a detailed listing of the cleaning requirements by facility and room. The rooms are grouped and given a priority rating and a cleaning frequency. A service response time is also included.

Value-In and Support Services is responsible for monitoring and conducting the audits as specified in the contract to ensure that the quality outcomes are being met. Reports are made monthly to the Quality Committee for Housekeeping, Food and Laundry, which is chaired by the Chief Medical Health Officer. In our interviews, we frequently heard of ongoing issues about cleanliness of the facilities, but the housekeeping audit reports indicate that the standards set by the contract are generally being met.

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Vancouver Coastal Health has also entered into a contract with a provider of reprocessing services. The contract includes:

- consultation services, which include an initial site assessment, program implementation recommendations and expertise, ongoing collections management, and reporting for "single use device" and reprocessing programs for two specific services; and
- device reprocessing services—the reprocessing of contractor-approved medical instruments, which includes cleaning, sharpening, functional testing, sterile packaging and sterilizing as required by device type.

The contractor must report on the number of devices processed. It is not required to report any breakdowns of its machinery that may impact the sterilization process or any test results to ensure the equipment is functioning properly. However, the contractor does warrant that it will perform its services in accordance with the U.S. Food and Drug Administration Quality System Regulation. The contractor guarantees the sterility of reprocessed medical instruments unless the packaging of the medical instrument has been opened or damaged and the functionality of the reprocessed medical instruments until such instruments have been used in one medical procedure.

Practice Monitoring

There is no formal ongoing monitoring of practice such as hand washing or use of gloves. However, we did hear that there is informal monitoring in that the Infection Control Practitioner may notice someone using gloves improperly or not hand washing and will bring it to his or her attention. This type of informal monitoring is also said to be done by departmental managers. Informal monitoring is beneficial, but we believe there needs to be a formal mechanism in place to monitor hand washing, since it is well documented that hand washing is the best line of defence against the spread of infectious organisms.

Being well aware of this the health authority, supported by Bayer HealthCare, was in the initial stages of a year-long hand washing campaign, "Clean Hands for Life" (based on a World Health organization initiative). The campaign takes a multifaceted approach, the effectiveness of which is measured. For example, at

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Providence Health Care, hand hygiene audits are to be conducted. At other Vancouver Coastal Health facilities, staff are completing pre- and post-campaign surveys. In addition, the consumption of hand hygiene products (e.g., paper towels, hand soap and waterless hand wash gel) is to be measured. All Vancouver Coastal Health facilities were involved in the campaign.

The infection control program has a standardized Infection Control Audit Tool available that was in place and used prior to the health authority reorganization of 2001. However, it has seen limited use since that time. The audit focused on both structure and process, and included inspections of the physical plant and equipment; assessments of health care workers' knowledge of infection control principles through the use of an anonymous self-assessment tool; assessment of policies and procedures and a review of workplace infection control practices. A final report provided to the department involved in the audit included recommendations and action dates.

We believe that the infection control program should consider re-introducing the use of this audit as time and resources permit.

Antibiotic use is another aspect of monitoring, one which predominantly occurs in acute care facilities and which we found is inconsistent across the authority. In the larger facilities, such as VGH and St. Paul's, the Pharmacy and Therapeutics Committee have Antibiotic Use Subcommittees. At the other sites, the Pharmacy and Therapeutics Committee is charged with this responsibility. Responsibility for monitoring also varies by site and may include medical microbiologists, Infection Control Practitioners or pharmacists. The laboratory department at VGH produces antibiograms, which highlight specific organisms and their susceptibility to different antibiotics and therefore assist in ensuring appropriate antibiotic use. Exhibit 5 is an example of an antibiogram.

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Exhibit 5

Vancouver General Hospital Antibiogram: Gram-Negative Organisms, Percent Susceptible, 2003/2004

Antibiotic	E. Coli	Klebsiella Pneumoniae	Enterobacter Cloacae	Proteus Mirabilis	Acinetobacter Baumanii	Serratia Marcescens	Pseudomonas Aeruginosa
# of isolates	3106/3215	789/765	286/301	329/276	173/205	247/236	580/659
Amikacin	100/100	100/100	100/100	100/100	98/95	100/100	95/97
Ampicillin	55/51	0	0	81/82	0	0	0
Cefazolin	89/89	96/96	0	92/93	0	0	0
Ceftazidime	97/99	83/89	83/74	100/100	92/73	85/86	91/94
Ceftriaxone	97/99	100/100	83/74	99/100	65/51	97/96	33/29
Ciprofloxacin	78/69	91/93	86/90	91/88	78/65	86/85	61/65
Gentamicin	88/87	99/99	99/99	93/95	92/71	99/97	78/86
Imipenem	100/100	100/100	99/100	99/100	99/98	99/98	91/88
SXT	73/69	92/93	91/93	87/88	78/69	97/94	0
Timentin	86/85	95/95	74/95	100/100	91/70	92/88	88/86
Tobramycin	89/87	89/99	98/99	92/95	98/94	95/96	92/98

Source: Vancouver Coastal Health Authority, A New Portfolio for Infection Control: Annual Report 2004

We also found policies in place that support appropriate antibiotic use, such as automatic stop dates for antibiotics and prescribing restrictions. These policies vary across the authority by the facility.

Vancouver Coastal Health, through Public Health, is participating in the "Do Bugs Need Drugs?" program, an initiative that started in Alberta and is directed at educating the public about antibiotic resistance and the appropriate use of antibiotics. The program promotes three key messages:

- Hand washing is the best way to stop the spread of infections.
- Not all bugs are created equal. Both bacteria and viruses cause respiratory tract infections. Antibiotics work against bacterial infections and not against viral infections such as colds and flu.
- Antibiotic resistance is a problem. Use antibiotics wisely to prevent bacteria from becoming resistant to antibiotics.

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The program was to be launched in the fall of 2005 in Grade 2 at local elementary schools.

External Monitoring

Vancouver Coastal Health participates in the accreditation process of the Canadian Council on Health Services Accreditation, a national, non-profit, non-government independent body that offers health organizations a voluntary, external review process to assess quality by developing national standards, assessing compliance with those standards and sharing the information from the reviews and decisions. The accreditation review process highlights both strengths and areas for improvements and includes recommendations.

The accreditation standards for the environment include several that are specific to infection control. Vancouver Coastal Health participated in this accreditation process in October/November 2004 and received their report in February 2005. The report contained a recommendation in the area of Patient Safety (acute surgery) requiring the authority to submit a progress report in 12 months: "It is recommended that the team work with the region to enhance the infection control program in order to ensure consistent application across all sites, including the rural sites. This program needs to include monitoring, awareness, and education." A presentation made to the accreditation surveyors in November 2005 in response to the recommendation showed: the additional staffing; the development of an exposure management policy; work being done on the development of the regional surveillance program; and participation by the health authority in both the hand hygiene campaign and the "Safer Healthcare Now!" campaign.

Providence Health Care was also involved in the accreditation process. The report specific to it recommended that the organization provide sufficient resources to support an integrated, proactive approach to infection control across the system—especially because the agency cares for several high-risk populations. The report also commented positively on the recent hiring of an Infection Control Officer and third Infection Control Practitioner. Other areas noted for improvement included the need to increase access to hand-washing facilities to increase proactive organization-wide monitoring for infection.

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Vancouver Coastal Health also participates in the annual provincial housekeeping audit conducted by WesTech Systems FM, Inc. and reported publicly by the health authorities. This audit is based upon cleaning outcome standards and risk categories for areas of the facilities (e.g., rooms categorized as very high risk, such as operating rooms, have a low tolerance for unclean inspection elements). The best practice benchmark is 85%. The initial audit was conducted in May 2005. Vancouver Coastal Health as a whole scored above the benchmark, but seven facilities fell below the benchmark. Those were a mix of residential, acute and rehabilitation care, plus community health centres.

The health authority is involved in research to enhance the practice of infection control

Vancouver Coastal Health is affiliated with the University of British Columbia and as such is very involved in conducting and leading research across all aspects of care—the infection control program included. In addition, we were told that the authority wants to be a leader in infection control in Canada, and to have policies and guidelines that are well researched and based on science.

The two proposals below show the type of research that the health authority is undertaking or seeking funds for:

- One proposal is to the Canadian Patient Safety Institute, to fund a demonstration project for an, "Early Identification System for the Prevention and Control of Potentially Transmissible Infections in Acute and Long Term Care Facilities." Early recognition of patients with suspected transmissible infections, combined with timely implementation of appropriate infection control protocols, is key to preventing and controlling the spread of pathogens. The project therefore proposes to monitor inpatients in acute and affiliated long-term care facilities using a combination of syndromic surveillance algorithms, patient history, presenting complaint and lab data, and daily ward review. This work would build on previous work done by the authority in the area of syndromic surveillance. Evaluation is to involve: 1) assessing the effectiveness of the system in reducing the number of exposure events to patients; 2) ascertaining the predictive

accuracy of the respiratory and gastrointestinal algorithms; and 3) evaluating the effectiveness of staff training and provision of ongoing feedback on completeness and appropriateness of infectious disease flagging.

- The other proposal is linked to the hand hygiene campaign discussed under Practice Monitoring. The proposal was submitted to WorkSafe BC for funding to support a senior researcher to collect and analyze the data from health care worker focus groups, surveys and poster contest submissions during the year-long campaign.

  The purpose of this project is to measure the effectiveness of specific aspects of the campaign on health care workers' knowledge, attitudes and intent to comply with hygiene guidelines. Specific objectives of the research are to identify: 1) individual, environmental, and organizational factors that influence workers' intent to comply with health care facility hand hygiene guidelines; 2) differences in beliefs and attitudes towards hand hygiene between various groups of workers and patient/residents; and 3) factors that contribute to the success and/or failure of a regional hand hygiene campaign.

In addition, those we interviewed spoke about other research underway or being planned, such as the joint work of St. Paul's and Public Health in examining the transmission of VRE in the Downtown Eastside. This research builds on previous work that looked at the transmission of MRSA in the Downtown Eastside. There is also a project on the provision of influenza vaccinations to acute care inpatients at VGH.

Information system support for infection prevention, surveillance and control is limited

A key requirement of a comprehensive infection control program is that it enable access to good data so that the authority can understand infection rates and be able to take action to address the rates and to report on the overall program. We expected Vancouver Coastal Health to have information systems in place to support the infection control program.

Conclusion

The information system in place in Vancouver Coastal Health does not have a module to support the infection control program across the continuum of care. Even within Public Health, two different systems are in place.

Findings

Vancouver Coastal Health does not have a standardized reporting system in place for its infection control program

Vancouver Coastal Health has a variety of information systems in place across the authority. For example, Vancouver Acute has PCIS (carecast), Lions Gate Hospital has McKesson, Richmond Health Services has Health Vision, and Powell River has a version of Meditech. None of these systems provides an infection surveillance component. The information systems that support the laboratory services across the authority are also varied, but have a greater degree of commonality. For example, Vancouver Acute and Richmond Health Services have Misys/Sunset, while Lions Gate Hospital has Sunset. Lab system reporting supports the infection control program.

The business case that was developed identified that the health authority lacked computerized surveillance at two of the four large hospitals (Richmond and North Shore/Coast Garibaldi) and limited capacity at both Providence Health Care and Vancouver Acute Care.

The authority's *Information Management/Information Systems 2006–2013 Plan into Action* does not speak specifically to infection control. The exception is the Primary Access Regional Information System (PARIS) in Vancouver Community: it includes Public Health.

Information system support for infection prevention, surveillance and control is limited

At the time of our fieldwork, the authority was in discussion with a software developer for the development and implementation of software to support the regional surveillance of nosocomial infections within facilities owned and operated by Vancouver Coastal Health. The software program was expected to capture information on: patient/residents; their "encounters" with acute and long-term care facilities owned and operated by the authority; and relevant "events" including identification of one or more of the following organisms: MRSA, VRE and CDAD. The program was also to permit the addition of new "event modules" as required, and to allow for longitudinal tracking, including movement between authority-owned and -operated facilities.

Surveillance data is currently collected by hand and then put into either Excel spreadsheets or a database (depending on the site) to allow for analysis. For example, VGH currently uses the ACCESS database for surgical wound surveillance, although ACCESS is not integrated into the operating room management system.

There has been a regional drive to have all Infection Control Practitioners access and input data and information. The minutes of the Infection Control Team meeting of February 2005 note that the infection control program was given money to purchase computers for the team and a tablet PC (an electronic tool on which a person can write and then have the computer convert it to typed text). A PC and laptop were also to have been purchased for each HSDA. None of these data collection tools was mentioned in our interviews.

Providence Health Care has a separate information system from that of Vancouver Coastal Health, but is in the process of standardizing it with the authority's system—a migration process that is expected to take about two years. The epidemiologist at Providence Health Care accesses data from the lab and other systems, such as ORMIS (Operating Room Management Information System), to support the infection control program. We were told that the information system at Providence was archaic and inadequate.

Public Health (within Vancouver Community and Richmond Health Services) has recently started using the Primary Access Regional Information System (PARIS). PARIS is specific to community health and supports client registration, referrals, assessments, case notes, care plans, and scheduling. It also supports

Information system support for infection prevention, surveillance and control is limited

communicable disease reporting. PARIS will link with the Integrated Public Health Information System (iPHIS). Even before the introduction of PARIS, Public Health in Vancouver did not use iPHIS as its information system.

The North Shore Coast Garibaldi HSDA uses iPHIS, which supports a number of public health programs, including immunization records and communicable disease case management and reporting. Even with iPHIS, much of the data collection is paper-based, with the data being entered into the system rather than data entry occurring at the point of care. The exception to this is immunization data, which can be entered at the point of care, by Public Health staff. We were told by Public Health on the Sunshine Coast that some physicians in that area give immunizations and then send the information to Public Health for entering into the system.

Occupational Health and Safety uses the Parklane incident tracking system. The system covers baseline health assessments and tracks immunizations, staff flu vaccine uptake and TB skin tests. The system also has a recall module that supports reminders.

Data collection and tracking provides a picture of nosocomial infections in the health authority

For 2004, annual infection control reports in Vancouver Coastal Health were issued by a cluster of agencies (e.g., G.F. Strong, George Pearson Centre and Dogwood Lodge) or by site (e.g., UBC.) The reports all contained information on MRSA, VRE and CDAD rates for the current year only or trending over a number of years. As well, the reports included either a narrative section on outbreaks or a table providing details of the outbreaks.

In addition, Vancouver Coastal Health issues an infection control report containing this information for the whole authority. The information regarding MRSA, VRE and CDAD is reported separately for long-term care and acute care. Estimated costs are also included for each of these organisms. Exhibits 6–8 provide examples of the tables included in the report. (All of the reports advised that because standard collection methods and definitions may not have been used, readers were to use caution in making comparisons between facilities.)

Information system support for infection prevention, surveillance and control is limited

Exhibit 6

Acute Care: MRSA Rates per 1000/Acute Bed Days

Site	Total MRSA[1]	Inpatient Bed Days[2]	Cases/1000 Bed Days
VGH	394	225,630	1.75
UBC*	53	46,677	1.14
RHS	84	50,293	1.67
LGH	115	96,423	1.19
PR	19	11,066	1.72
SM	25	13,479	1.85
SQ[3]	7	Not available	–

Source: Vancouver Coastal Health Authority, *A New Portfolio for Infection Control: Annual Report 2004*

* Subacute

1. Inpatient MRSA cases only
2. Inpatient days (excluding ambulatory clinics and diagnostic visits)
3. For the months of November - December when surveillance commenced.

Notes:

- In total there were 697 cases of MRSA identified in acute care facilities in 2004. Acute care facilities conduct routine screening as well as clinical isolate testing. Consequently, the 697 cases represent patients who were admitted with the microorganism as well as those that acquired MRSA within the facility.
- The mean rate for MRSA for acute care facilities is 1.55 per 1000 patient bed days with a range of 1.14 to 1.85. There are no appreciable differences between reported rates for each of the sites.
- At present, duplicates (i.e., Patients counted more than once) exist in the system especially in larger hospitals such as Vancouver Acute that receive many transfers. The transferred case may be counted twice: once from the transferring facility and once from the receiving facility. The development of the common regional database will prevent duplication and give an accurate picture of the movement of affected patients throughout the health care system.

Information system support for infection prevention, surveillance and control is limited

Exhibit 7

Costs for MRSA Management

Site	MRSA Total Cases[1]	2004 Dollar Cost[2]
Vancouver General Hospital	404	$2,424,000
G.F. Strong	52	$ 312,000
George Pearson Centre	8	$ 48,000
Dogwood Lodge	1	$ 6,000
UBC Hospital	54	$ 324,000
Richmond Health Services	85	$ 510,000
Lions Gate Hospital	115	$ 690,000
Powell River	23	$ 138,000
St. Mary's Hospital (Sechelt)	34	$ 204,000
Squamish Hospital	7	$ 42,000
Total	783	$4,698,000

Source: Vancouver Coastal Health Authority, *A New Portfolio for Infection Control: Annual Report 2004*

1. Inpatient bed days (excluding ambulatory clinics and diagnostic visits).
2. At an average cost of $6,000 per patient (colonized or infected). This estimate reflects previous in-house studies for MRSA and VRE but also reflect the decreased costs with more streamlined management protocols.
3. For the months of November - December when surveillance commenced.

Notes:

- Based on an average cost of $6,000 per patient, regardless of whether the patient was infected or only colonized (colonized means that the patient has the organism but does not have an infection), the total hospital-associated cost of MRSA is approximately $4,698,000. This figure may underestimate the true economic burden of MRSA in the region, however the true figure will be determined next year once the regional database is in place and sites conduct surveillance in a similar manner.

Information system support for infection prevention, surveillance and control is limited

Exhibit 8

Outbreaks of Communicable Infections in Long Term Care and Acute Care

A: Long Term Care

Site	Facility	Organism	Patients/Staff Affected	Duration Unit Closed
VGH	BP2	Norovirus	45 pt./10 st.	15 days
	BP2	Norovirus/Influenza	13 pt/1 st	16 days
GFS	-	-	-	-
Dogwood	-	Influenza	31 pt/0 st	17 days
LGH	Evergreen 2N	Influenza	Information not available	15
	Evergreen 2N, 3S, TCU	Norovirus		12
	Evergreen 1S	Norovirus		9
	Evergreen 1N	Influenza		8
	Kiwanis	Norovirus		10
GPC	GPC	Influenza	7 pt/0 st	8 days
	GPC	Influenza	3 pt/0 st	9 days
UBC	Purdy	Norovirus	18 pt/5 st	7 days
RHS*	Minoru 2W	Influenza	33 pt	5 days
SM	Totem/Kiwanis	Norovirus	6pt/12 st	-
Total				**131**

* The outbreak extended to January 8, 2005. The January numbers have not been included here

B: Acute Care

Site	Facility	Organism	Patients/Staff Affected	Duration Unit Closed
VGH	BMT	Paraflu	6 pt/ 0 st	0 days
	Psych E2	Norovirus	5 pt/ 1 st	3 days
	BMT	RSV	4 pt/ 0 st	0 days
UBC	Subacute 2B	Norovirus	11 pt/ 7 st	4 days
RHS	2S	Norovirus	23 pt/ 19 st	13 days
LGH	2 W	Norovirus	2 pt/ 0 st	0 days
	7 E	Norovirus	3 pt/ unknown	0 days

Source: Vancouver Coastal Health Authority, *A New Portfolio for Infection Control: Annual Report 2004*

Notes:

- In total, there were 20 outbreaks of communicable infections in the region in 2004 affecting in excess of 210 patients and at least 55 hospital staff (data are incomplete in this group). The length of unit closure is dependent upon the timeliness of the identification of an outbreak situation and the effectiveness of the intervention(s) applied. The total days of partial or full unit closure ranged from a low of 0 days to a high of 17 days. Additional in-services and attention to infection control protocols and vaccination are recommended to reduce both the incidence of outbreaks as well as their duration.

Information system support for infection prevention, surveillance and control is limited

Although available on an annual basis, such reporting is not done on a more frequent basis (e.g., quarterly) even though the data is available. We did not see similar types of reports for Providence Health Care, but we were told that it does surveillance for VRE and MRSA and is working to improve it.

Reportable disease reporting is done through the B.C. Centre for Disease Control and reports are issued. We did not see a specific communicable disease report issued by the health authority.

Vancouver Coastal Health has identified data quality assurance as an issue and is taking steps to address it

For Vancouver Coastal Health to understand its infection rates across all HSDAs the authority needs to be certain that data being collected, analyzed and used is defined, interpreted and collected in the same way.

At the time of our fieldwork, collection methods and data definitions were not standardized across the authority, which Vancouver Coastal Health was well aware of. As it noted in its 2004 annual report, *A New Portfolio for Infection Control*:

> "The different hospitals in the region have been conducting surveillance for nosocomial infections using a variety of case definitions, data collection forms and protocols. Lack of standardization in the surveillance protocols and data collection process makes it difficult to make direct comparisons."

The Hospital Epidemiologist, Infection Control has a key part in the infection control program, being responsible for establishing and maintaining a regional surveillance system, including consistency of reporting. At the time of our fieldwork, steps were under way to improve data quality by, for example developing of the standardized collection tool and data definitions for VRE, MRSA and CDAD surveillance.

The epidemiologist at Providence Health Care is also working to maintain data quality as the agency's surveillance system is developed.

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

We expected to see regular reporting by the infection control program to the Health Authority Medical Advisory Committee (HAMAC), the senior executive team and the board, and to see that these groups were discussing the reports and initiating action or follow-up as appropriate.

Conclusion

Information about the infection control program is regularly received and discussed by both the governance level and senior executive staff. However, limited information is going to the Health Authority Medical Advisory Committee, and in turn there is no reporting by HAMAC to the Board of Directors on issues related to infection control.

Findings

Vancouver Coastal Health uses infection control reports to support and improve infection control practice both at the site level and across the whole authority

As we noted above in discussing research and monitoring, Vancouver Coastal Health uses reports and information to improve infection control practice across the health authority and at the individual site level.

We saw reports from debrief sessions following outbreaks that identified what went well and what required correction to improve management of the outbreak. For example, one such debrief identified that there needed to be further staff education to increase the awareness of infection control resources (and timely notification). In addition, it identified the need for some changes to the outbreak management process.

Infection Control Practitioners may also carry out small focused audits in their areas of responsibility. For example, an audit of urinary drainage bags was undertaken, which identified both a shortage of equipment and a need for staff education.

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

In addition, the Vancouver Coastal Health uses reports and information from other agencies to assess their own practices and make changes as required. One example of this is a report from Health Canada that identified not only contamination of ultrasound gels at the manufacturing stage, but also a number of practices within facilities that could lead to contamination of medical gels and ultrasound gels. As a result of the recommendations in the Health Canada report, the authority changed its practice and with the notice to departments, adding "Please be advised that all users of gels must submit to Infection Control your revised protocol reflecting the above changes."

The minutes of the various Infection Control Committees that we reviewed indicate that issues and reviews are discussed and action taken as required.

The board receives regular information on the infection control program

The Board of Directors is responsible for managing, or supervising the management of, the affairs and business of the authority and has ultimate responsibility for the provision of medical care. Thus the Board has a role to play in the oversight of the infection control program either directly or through its Quality and Performance Measurement Committee. The purpose of the committee is to "assist the Board in fulfilling its obligations to ensure the continuing high quality patient-centred care and equitable access to health services, consistent with the requirements of the Performance Agreement within the Vancouver Coastal Health Authority." Detailed duties and responsibilities of the committee are shown in Exhibit 9.

The committee is accountable to the board, reporting both through its minutes and through an oral report delivered at the board meetings. The committee meets every two months and has a schedule for receiving various reports monthly, quarterly or annually.

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

Exhibit 9

Excerpt of Duties and Responsibilities of the Quality and Performance Measurement Committee

Subject to the powers and duties of the Board, the Committee will:

A. Regularly review with management the key markers and performance indicators used to measure the quality of patient service provided by the Authority including patient needs and wellness. Work to identify and close any gaps between current measurements and best practices in performance management.

D. Regularly review reports with respect to unusual occurrences, complaints, and levels of satisfaction and regularly provide these reports to the Board.

E. Review all major adjustments to any programs to determine impact on the quality of care and access.

F. Regularly review relevant management reports to (i) monitor the quality of care being provided and patient needs and wellness; and (ii) identify trends and problem issues for further investigation and monitoring.

Source: Vancouver Coastal Health Authority Terms of Reference for the Quality and Performance Measurement Committee (April 2003)

The board is also to receive regular reports from the Health Authority Medical Advisory Committee on the quality, effectiveness and availability of medical care provided (in relation to professional standards) in facilities and programs operated by the authority.

Our review of the board minutes and interviews with staff showed us that the board is receiving information on a wide variety of topics within the infection control program and Public Health. The minutes reflect mostly verbal reports from the Vice-President, Clinical Quality and Patient Safety and/or the Chief Medical Health Officer. Topics covered include pandemic planning, changes to the infection control program, development of protocols, and indicators. What is missing in this reporting is any statistical data regarding trends in outbreaks or regular surveillance reports.

We saw no evidence of reporting of issues related to infection control from the Health Authority Medical Advisory Committee (HAMAC) to the board.

Providence Health Care's own Board of Directors also receives very limited reporting on issues related to infection control.

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

The senior executive team receives limited information about the health authority's infection control program

We were told that, as members of the senior executive team, the Vice-President, Clinical Quality and Patient Safety and the Chief Medical Health Officer both provide verbal reports on any issues related to infection control or other information that is important to the team. A review of the minutes of the senior executive team from early 2003 to 2005 indicate that some issues related to infection control are on the agenda (e.g., communicable disease, immunizations and development of the program), but the minutes are brief and do not provide a comprehensive picture of what is reported or discussed.

As revealed by the minutes, the executive does not receive regular, formal reports on surgical site infections or other incidents of infections, with the exception of the infection control program annual report. We were told that senior executive team receives the housekeeping audit reports every period, but we did not see this noted in the minutes we reviewed.

The minutes of the leadership teams in each of the HSDAs and at Providence Health Care indicate that issues and information on infection control are discussed and acted on as required.

The Health Authority Medical Advisory Committee does not regularly receive and review reports on the infection control program

The Health Authority Medical Advisory Committee (HAMAC) is charged with providing advice to the board and the CEO on: the provision of medical care within the facilities and programs operated by the authority: the monitoring of the quality and effectiveness of medical care; the adequacy of resources; and the continuing education of the medical staff. Specific duties of HAMAC include: receiving, reviewing and making recommendations on reports from quality review bodies and committees concerning the evaluation of clinical practice; submitting regular reports to the Board of Directors and CEO on the quality, effectiveness and availability of medical care provided; making recommendations, where appropriate, concerning the quality of medical care; and making recommendations, where appropriate, concerning the availability and adequacy of resources to provide appropriate patient care.

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

Membership in HAMAC includes medical staff appointed to medical leadership roles in the health authority, medical staff elected by the medical staff, the Medical Health Officer of the authority, the Senior Medical Administrator of the authority, the Chief Executive Officer (as a non-voting member) and other senior administrative and medical staff as appropriate and as non-voting members.

A Quality of Care Committee of HAMAC was created in July 2004, with membership approved in September 2004. The November 2004 minutes of HAMAC note that "the Quality of Care Committee needs to get up and running." The Regional Infection Control Committee, which was formed in 2005, reports through the Quality of Care Committee of HAMAC.

In addition, Local Medical Advisory Committees (LMACs) receive reports from the Infection Control Committees at each constituent hospital. The LMACs report to HAMAC. The Chairs of these LMACs are members of HAMAC. As well, issues of infection control also go to the appropriate medical staff departments as required. For example, reports or information regarding surgical site infections go to the Department of Surgery.

Our review of the minutes of HAMAC indicated that it received very limited information on issues related to infection control. We were told that HAMAC is still finding its role, and that the Quality of Care Committee was still forming its relationship with the Infection Control Committee. It only received its first report from the committee in November 2005.

Our interviews with medical staff reflected the mix of medical staff organization and possible routes through which staff might see reports on infection surveillance and control. Some received infection control information and reports by attending Medical Advisory Committee meetings or departmental meetings, or by being a member of an Infection Control Committee.

Providence Health Care has its own set of Medical Staff Bylaws that define the roles and responsibilities of its Medical Advisory Committee. In addition, the bylaws include general principles regarding the relationship of the Medical Advisory Committee with Vancouver Coastal Health. Exhibit 10 highlights these principles.

Our review of the minutes of Providence Health Care's Medical Advisory Committee indicated limited information regarding infection control—although, in 2005, with the development of the infection control strategic plan, there was more discussion of the topic.

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

Exhibit 10

General Principles

- The Providence Health Care MAC will provide a regular update on its activity to the Vancouver Coastal Health Authority MAC.
- The Board of Directors of Providence Health Care, on the advice of the MAC, may establish sub-committees, reporting to MAC, to undertake specific responsibilities related to the medical staff organizations of Providence Health Care and the Vancouver Coastal Health Authority.
- The composition and terms of reference of all such sub-committees shall be delineated in the Medical Staff Rules.
- Recommendations from the Providence Health Care MAC requiring the attention of the Vancouver Coastal Health Authority Board of Directors shall be forwarded through the Chair of the Providence Health Care Board of Directors to the Chair of the Vancouver Coastal Health Authority Board.
- Recommendations from the Providence Health Care MAC requiring the attention of the Vancouver Coastal MAC shall be forwarded by the Chair of the MAC to the Chair of the Vancouver Coastal Health Authority MAC.

Source: Providence Health Care, Medical Staff Bylaws (May 2004)

Vancouver Coastal Health reports externally on its infection control program

The Health Act requires that communicable diseases be reported to Public Health and subsequently to the B.C. Centre for Disease Control, which receives these reports on behalf of the Provincial Health Officer (the centre then reports these diseases to the Public Health Agency of Canada). As well, Vancouver Coastal Health must, as part of its Performance Agreement with the Ministry of Health, report on three measures related to immunizations: the rate of up-to-date immunizations for two-year-olds; the rate of influenza immunization for residents of care facilities; and the influenza immunization rates for healthcare workers.

We found that Vancouver Coastal Health meets all of those reporting requirements.

In addition, the health authority issues an annual report on its infection control program. In 2004, in addition to the region-wide report, clusters and agencies within the authority also issued reports (the exception was Providence Health Care). The reports included: infection rates for specific organisms such as MRSA and C. difficile; surgical site infection rates where monitored; outbreaks information; education provided to staff; and information about any special

Reporting on the prevention, surveillance and control of infections across Vancouver Coastal Health is extensive

projects under taken. Exhibit 11 shows the eight key performance indicators of the infection control program that Vancouver Coastal Health has identified for reporting.

What the report, does not include is any information related to Public Health and communicable diseases in the community.

Vancouver Coastal Health has made its infection control annual report available on its website, as well as its monthly quality reports, which include the results of its housekeeping audit.

Exhibit 11

Infection Control Key Performance Indicators

Indicator 1: Selected antibiotic resistant organisms identified in inpatients and outpatients*

Indicator 2: The incidence of C. difficile associated diarrhea in inpatients*

Indicator 3: Selected inpatient surgical procedures complicated by surgical site infections as defined by NNIS (Centres for Disease Control, Atlanta) at VGH, UBCH, LGH

Indicator 4: Syndromic surveillance of respiratory diseases at VGH

Indicator 5: Hospital-acquired bacteremias at VGH

Indicator 6: Patients identified as having *M. Tuberculosis**

Indicator 7: Number of hours spent on infection control education/in-services

Indicator 8: Outbreaks of communicable diseases*

* data collected at all sites

Source: Vancouver Coastal Health Authority, A New Portfolio for Infection Control: Annual Report 2004

Response from the Vancouver Coastal Health Authority

Response to the Report of the Auditor General of British Columbia
On Infection Control

Vancouver Coastal Health Authority

February 2007

Vancouver Coastal Health appreciates the opportunity to respond to the OAG report "Infection Control: Essential for a Healthy British Columbia". We have reviewed the report and offer the following responses to the major observations and recommendations contained therein. In general, our own strategies and plans are in line with the recommendations and we are supportive of the concluding comment that "Vancouver Coastal Health has set clear direction: the establishment of a regional infection control program…."; some areas where we feel there are differences between our plans and the report's conclusions are detailed in the specific notes below.

Specific comments and responses:

1) *The report refers in a number of sections to the continuum of care; in this we must assume that this refers to the areas of care which the HA directly operates or controls since the report, as noted, did not examine family doctor's offices or other non-affiliated entities. Within the areas of acute care, community care, and residential care for directly operated facilities, there is substantial effort being made by VCH to link infection control practices.*

    a. *Regional committees including the HAMAC, the HAMAC Quality of Care Committee, the Regional Infection Control Committee and the Biological Response Advisory Team include representation from all areas of the continuum;*

    b. *The Chief Medical Health Officer or his designate sit on both the HAMAC and the Quality of Care Committee. In addition both the MHO office and the acute hospital infection control programs are members of the Value-In structure which supervises outsourced contracts including for quality control;*

    c. *Discharge planning nurses from acute to transitional care and/or residential care do provide information across the continuum;*

d. The expanded use of the regional medical information system linkage project ("Care Connect") will expand the ability of care providers across the continuum to view and input relevant information related to infection control.

We believe that an excellent example of this integration is the response to the devastating outbreak of Invasive Pneumococcal Disease that took place on the Downtown East Side of Vancouver in the fall of 2006. The outbreak was identified by epidemiologic surveillance at Saint Paul's Hospital and information was transmitted openly and often amongst all relevant areas including IC and Public Health. Cooperation on patient care (outside the scope of this report) was extremely close and linkages between IC and PH allowed Emergency Departments and critical care areas to better deal with the patients they saw. Use of the "Sepsis Protocol" developed at SPH led to a very low mortality in spite of the severe nature of the presenting illness in this vulnerable population, and finally PH undertook an aggressive vaccination campaign in the DTES which likely helped to halt the epidemic transmission of the responsible serotype of Streptococcus pneumoniae. We are particularly proud of the way that VCH and PHC responded to this threat and feel that this is a good example of how far we have progressed.

2) We are pleased that the OAG staff have referenced the positive steps being taken in the Health Service Plan to further enhance infection control across VCH/PHC and commented on the significant steps we have taken. It is our intention to continue this planning and continue to inform the public of our outcomes via our public report, published on the VCH website.

3) The report notes standardization of infection control manuals and related information across the HA as a gap. We acknowledge this was the case at the time of the visit and offer the following responses/updates:

a. Communicable Disease manuals for non-acute areas, schools, etc are consistent via the office of the CMHO;

b. The regional infection control manual has been further refined and is now available across VCH on the internal Intranet (November 2006). An updated version of this is to be distributed by the end of the 2006-07 fiscal year;

c. There is a standardized infection control manual for residential care, originally developed in VCH but now adopted provincially. This has been offered to all non-owned and operated facilities. The HA continues to offer our infection control manuals and related information to private residential care operators within our catchment area

d. *The "What's New" plan noted on page 10 has been completed*

e. *Signage and algorithms related to infection control have now been standardized across the HA (for example, related to respiratory infections, infectious isolation, etc).*

f. *Providence Healthcare has an infection control manual which is used across its acute and residential care sites; this complies with CDC and Health Canada definitions.*

4) *The business case which led to the regionalization and enhancement of the regional program came about from recommendations of the Regional Infection Control Interest Group (now reconstituted as the Regional Infection Control Committee with a more clear reporting structure); the business case was not solely in response to the SARS epidemic as inferred on page 11.*

5) *Providence Healthcare has 1.25 FTE equivalent medical microbiologists who cover infection control; in addition, PHC has recently added 2 new infection control physicians (0.5 FTE each) for acute and residential care.*

6) *As noted in the summary report, the standard for ICP has been reduced to 1 per 100 acute care beds and both VCH and PHC are committed to attaining this ration; resource constraints and personnel are the mitigating factors.*

7) *There have been substantial enhancements to the reporting of infection control via the HAMAC since the report interviews were conducted.*

a. *The HAMAC Quality of Care Committee meets regularly and now receives the minutes of the Regional Infection Control Committee (RICC).*

b. *A senior MHO is a regular member of the Quality of Care Committee.*

c. *The Regional Medical Director of infection control has begun reporting to the Quality of Care Committee and the HAMAC including data on infection rates, outbreaks, etc across VCH*

d. *Individual Area MAC continue to receive reports from their own sites regularly. This provides for local knowledge and insight while still contributing to a regional roll-up report*

e. *As noted, Providence Health Care has a clear reporting structure via its MAC to Senior Leadership and the Providence Health Care Board.*

8) *VCH remains committed to increasing the numbers of Infection Control Practitioners (ICP) across the continuum of care. Given fiscal imperatives across all areas of care, we are working with the Senior Executive Team to allocate resources to this area. As noted, we have also hired an epidemiologist to oversee the introduction of the regional data base which is fundamental to providing better data related to infection rates across the continuum.*

9) *The report notes that VCH has 2 job descriptions for ICP. This is due to the diversity of skills in individuals who seek this role, combined with the need to satisfy 2 collective agreements (BC Nurses Union and Health Sciences Association). Also, training has now been standardized so that all new hires as ICP must take the UBC training course(s) at HA expense.*

10) *The description of Medical Infection Control Officers again highlights a central tenet of our program organization: a regional program with local delivery. We believe that the linkages described are important and that this facilitates cooperation and management of potential outbreaks and incidents while fostering local education and clinical development.*

11) *Page 15 comments on the "blurring" of roles between ICP and Occupational Health Nurses—this reflects flexibility and cooperation and we feel that it is more indicative of integration than role confusion.*

12) *Facility age and condition is a concern to the infection control program as noted. VCH currently operates scores of patient care areas, many of the building containing these areas are below standard for what would be considered optimal for infection control practices, reflecting capital under funding over many years. Notwithstanding this, the regional program has the following comments to make regarding facility design and renovation:*

    a. *Standardized construction guidelines for the HA have been developed and IC was involved in this;*

    b. *All plans for construction and renovation are now signed off by IC as suggested by the report;*

    c. *It is notable that a number of private facilities have asked the IC program for advice and review in their own construction and renovation programs;*

    d. *Focused expertise related to construction matters within the IC program continues to develop.*

    e. *The variability in the numbers of negative pressure rooms is of concern to VCH; this is one consideration in the plans for*

potential redevelopment of Saint Paul's Hospital given its tertiary mandate

13) *Infection control education and ongoing education for staff is a concern which we share with the report authors. Given the diversity of geography and practice across VCH, this has not been an easy task to integrate but the following enhancements are now in place:*

   a. *The on-line infection control module referred to in the report is now available and has been made mandatory for staff, medical staff, and all residents/students working in VCH facilities;*

   b. *More rigorous training of medical students and residents has commenced,*

   c. *All Health Service Delivery Areas and Providence Healthcare now have IC education "champions" who are promoting ongoing education;*

   d. *Presentations at rounds (acute and residential), and ward conferences and rounds with opportunities for education of staff and physicians are carried out regularly at many VCH sites, including Saint Paul's and Vancouver General Hospitals;*

   e. *ICP continuing education hours are now formally tracked;*

   f. *Funding for ICP education (and indeed the entire IC budget) has been separated from the laboratory budgets and is now specific and applied directly to ICP continuing education;*

   g. *The on-line IC module has been cited as a "Leading Practice" by the Canadian Council on Health Services Accreditation during their fall 2006 review of VCH;*

   h. *Both VCH and PHC continue to receive research funding related to education of staff and physicians*

14) *VCH has committed substantial resources in the last 2 years to the development, testing, and application of a regional infection control data base, as noted in the report. All sites are now reporting standardized rates for antibiotic resistant organisms (including methicillin resistant Staphylococcus aureus, and Vancomycin resistant Enterococci) as well as Clostridium difficile and Tuberculosis (for which there is long-standing data available). The epidemiologist is working to further expand the data base to capture standardized data on surgical site infections. Via the Provincial Infection Control Network (PICNet), VCH is supporting the Surgical Hospital Acquired Infection Program (SHAIP) which will*

enhance surveillance for surgical infections across the province. This is particularly important given that, as noted in the report, the ability of surveillance to be carried out is made more difficult in an era of same-day admission, day surgery, and rapid return to patient's home community/ hospital. Clearly, we agree that a provincial ability to follow and monitor SSI is imperative.

Providence Healthcare medical microbiologists monitor SSI by reviewing data in the laboratory IMIS system.

15) *Ongoing monitoring of quality for contracted providers including housekeeping is carried out by Value-In. This includes measures related to infection control and all contract staff are required by their employers to undergo education related to infection control relevant to their jobs.*

16) *VCH continues to work with the Province and Health Canada to ensure that reprocessing of all medical and surgical devices is carried out in accordance with Health Canada regulations.*

17) *The "Clean Hands for Life" program as noted has been extremely successful and VCH is committed to continuing it in a modified form. The issue of practice audits of staff regarding hand washing etc is complex and resources devoted to this must of necessity be diverted from other ICP functions. Nonetheless, VCH believes that this is an important adjunct to ongoing staff education and will be reintroducing these audits in a modified format in March of 2007.*

18) *Antibiotic resistance monitoring occurs at all VCH/PHC sites. This is reported to the local Drugs and Therapeutics Committees and the AMAC. At both Vancouver General Hospital and Saint Paul's Hospital this is summarized on a pocket card for clinicians and includes information on cost as well as efficacy.*

19) *Both VCH and Providence Healthcare are involved in extensive research, including peer reviewed research projects from CIHR, Michael Smith Foundation, and similar sources. While this is noted on page 31, we feel that the brief descriptions of 2 projects do not do justice to the depth and breadth of research in infection control being carried out across the region.*

20) *Information systems are crucial to effective monitoring of infection control as noted in the report. VCH at its formation inherited s wide array of information systems and is gradually working to standardize these, within the constraints of expensive information technology capital needs and competing priorities for capital funding. The Care Connect project referred to above will allow practitioners to see data across the continuum*

of care including from hospital to hospital and to laboratories reporting to Excellerис™. As noted above, the regional IC data base has now been completed and implemented and data is being consistently entered across VCH. In addition, the IMIS department has worked to increase availability of PCs across VCH.

The report notes that the Vancouver Community system (PARIS) will link with the iPHIS—in fact this is already in place. Moreover, both Vancouver and Richmond have reported data to iPHIS since its inception and prior to then via a system called CDSS. Many years of data for the region for reportable diseases are available from these data bases.

21) *The data base referred to above now allows consistent reporting across sites of infections so the current (2005–06) annual report, available on the VCH website, no longer carries the disclaimers noted on page 35 regarding different data and definitions.*

22) *Quarterly reporting as noted at the end of page 37 is now available.*

23) *Reportable disease notification is as mentioned on page 38 but is via the MHO as per the Public Health Act; some reporting of aggregate data is done via the BCCDC epidemiology center. In addition as of the 2006–07 fiscal year, this will be added to the annual report for influenza, norovirus, and tuberculosis. The CMHO reports to the VCH Board on any communicable disease issues, including at the public Board meetings.*

As of 2007, a new Public Health Surveillance unit will summarize all reports of reportable communicable diseases and these will be included in the MHO Annual Report.

24) *As noted above (point 5) reporting to the HAMAC, the Quality of Care Committee, and the Board has been further developed since the date of the review in the fall of 2005. Regular reports are now presented to the HAMAC and the Board is aware of these via the Chair of HAMAC report and the ongoing reports from the Vice President, Health Service Networks, Clinical Quality and Safety. Similarly, reports to the Senior Executive Team are made regularly and as necessary due to outbreaks and similar circumstances (for example during the recent Pneumococcal disease outbreak).*

As noted on page 42 of the report, the Area Medical Advisory Committees continue to receive detailed and specific information related to the infection issues at their sites; this local reporting is in our opinion more important than roll-up HA reporting in terms of quality improvement.

The Providence Healthcare MAC receives reports from infection control (IPAC) on a regular basis (at each meeting). This is incorrectly stated on page 42.

Finally, the QA reports on the contracted services continue to be reported to the SET and the Safety, Quality and Performance Measurement Committee of the Board regularly. These reports are circulated to SET every 2 months and reviewed at the Board meetings; they are also available on the public website.

25) *As noted above, communicable disease reporting is done via BCCDC and for 2006 – 2007 community reporting will also be added to the VCH annual report.*

Appendices

Appendix A: List of reportable communicable diseases in British Columbia

Reportable Communicable Diseases (reportable by all sources)		List of Communicable Diseases (reportable by laboratories only)
Acquired Immune Deficiency Syndrome	Leprosy	All specific Bacterial and Viral Stool Pathogens: (i) Bacterial: Campylobacter; Salmonella; Shigella; Yersinia. (ii) Viral
Anthrax	Lyme Disease	Amoebiasis
Botulism	Measles	Borrelia Burgdorferi Infection
Brucellosis	Meningitis all causes: (i) Bacterial: Hemophilus; Pneumococcal; other (ii) Viral	Cerebrospinal Fluid Micro-organisms
Cholera	Meningoccocal Disease: All Invasive; Including Primary Meningococcal Pneumonia and Primary Meningococcal	Chlamydial Diseases including Psittacosis
Congenital infections:	Conjunctivitis	Cryptococcus neoformans
Toxoplasmosis, Rubella, Cytomegalovirus, Herpes Simplex, Varicella-zoster, Hepatitis B Virus, Listeriosis, and any other Congenital Infection	Mumps	Herpes Genitalis
Cryptosporidiosis	Neonatal Group B Streptococcus Infection	Human Immunodeficiency Virus
Cyclospora Infection	Paralytic Shellfish Poisoning (PSP)	Influenza
Diffuse Lamellar Keratitis (DLK)	Pertussis (Whooping Cough)	Legionellosis
Diphtheria: cases, carriers	Plague	Leptospirosis
Encephalitis: Post-infectious, Subacute Sclerosing Panencephalitis, Vaccine-related, Viral.	Poliomyelitis	Listeriosis
Food-borne illness: All Causes	Rabies Reye's Syndrome	Malaria
Gastroenteritis epidemic: Bacterial, Parasitic, Viral	Rubella: Congenital Rubella Syndrome	Q fever
Genital Chlamydia Infection	Severe Acute Respiratory Syndrome	Rickettsial Diseases
Giardiasis	Smallpox	Severe Acute Respiratory Syndrome
Haemophilus Influenza Disease, All Invasive by Type	Tetanus	Smallpox
Hantavirus Pulmonary Syndrome	Transfusion Transmitted Infection	Tularemia
Hemolytic Uremic Syndrome	Tuberculosis	West Nile Virus Infection
Hemorrhagic Viral fevers	Tularemia	
Hemorrhagic Viral fevers	Typhoid Fever and Paratyphoid Fever	
Hepatitis Viral: Hepatitis A; Hepatitis B; Hepatitis C; Hepatitis E; other Viral Hepatitis	Venereal Disease: Chancroid; Gonorrhea – all sites; Syphilis	
Human Immunodeficiency Virus	Waterborne Illness: All causes	
Invasive Group A Streptococcal Disease	West Nile Virus Infection	
Invasive Streptococcus Pneumoniae Infection	Yellow Fever	

Source: Health Act Communicable Disease Regulation (BC Reg. 281/2004)

Appendix B: Canadian Standards Association infection control during construction or renovation of health care facilities (April 2003)

The standard describes precautionary and remedial measures for preventing exposure to agents, released or augmented, because of actions undertaken during health care facility construction, renovation, maintenance, and repair work.

Preventive measures are categorized as I, II, III and IV and are put in place for all stages of construction activity—before, during, and after. The prevention measures required are based on the analysis of population risk group and type of construction activity. Table 1 shows a preventive measures analysis and includes the use of information from Tables 2 and 3.

Table 1: Preventive Measures Analysis

Population Risk Group[1]	Construction activity type[2]			
	Type A	Type B	Type C	Type D
Group 1	I	II	II	III/IV
Group 2	I	II	III	IV
Group 3	I	III	III/IV	IV
Group 4	I - III*	III/IV	III/IV	IV

[1] See Table 2 to determine population risk group

[2] See Table 3 to determine construction activity

* When the risk group is Group 4 and construction activity is Type A, the infection prevention and control department shall be consulted to determine the appropriate preventive measure (I, II, or III).

Table 2: Population Risk Groups and Geographical Areas (Examples only)

Population Risk Group	Typical areas
Group 1 Lowest Risk	Office areas Public areas Physical plant workshops and housekeeping areas
Group 2 Medium Risk	Outpatient clinics (except oncology and surgery) Admission and discharge units Physical therapy areas remote from patient care areas

Appendix B

Population Risk Group	Typical areas
Group 3 Medium to high risk	Emergency (except trauma rooms) Nurseries for healthy newborns Geriatrics Nuclear medicine
Group 4 Highest risk	Intensive care units Oncology units and outpatient clinics for cancer patients Burn care units Trauma rooms Operating rooms Sterile supply areas

Table 3: Construction Activity Type (Examples only)

Construction Activity Type	Description
Type A	Inspection and non-invasive activities. These include but are not limited to: a) activities that require removal of no more than one ceiling tile or require wall or ceiling panels to be opened; and b) electrical trim work.
Type B	Small scale, short duration activities that create minimal dust. These include, but are not limited to: a) activities that require access to chase spaces; and b) plumbing work that disrupts the water supply of more than one patient care area (i.e., two or more rooms) for less than 30 minutes.
Type C	Activities that generate a moderate to high level of dust; require demolition; require removal of a fixed building component (e.g., sink) or assembly (e.g., countertop, cupboard); or cannot be completed in a single work shift. These include but are not limited to, a) activities that require sanding of a wall in preparation for painting or wall covering; b) removal of floor coverings, ceiling tiles, and casework; c) electrical work above ceilings.
Type D	Activities that generate high levels of dust and major demolition and construction activities requiring consecutive work shifts to complete. These include but are not limited to: a) activities that involve heavy demolition or removal of complete cabling systems; and b) plumbing work that disrupts the water supply of more than one patient care area (i.e., two or more rooms) for more than 1 hour.

Appendix C: Office of the Auditor General: Performance Auditing Objectives and Methodology

The Office has three lines of business:

- examining the reliability of the provincial public sector's financial reporting;
- assessing how well the public sector manages its key risks; and
- assessing the quality of provincial public sector performance reports.

Each of these lines of business have certain objectives that are expected to be achieved, and each employs a particular methodology to reach those objectives. The following is a brief outline of the objectives and methodology applied by the Office for assessing how well the public sector manages its key risks.

Performance Auditing

What are Performance Audits?

Performance audits (also known as value-for-money audits) examine whether money is being spent wisely by government —whether value is received for the money spent. Specifically, they look at the organizational and program elements of government performance, whether government is achieving something that needs doing at a reasonable cost, and consider whether government managers are:

- making the best use of public funds; and
- adequately accounting for the prudent and effective management of the resources entrusted to them.

The aim of these audits is to provide the Legislature with independent assessments about whether government programs are implemented and administered economically, efficiently and effectively, and whether Members of the Legislative Assembly and the public are being provided with fair, reliable accountability information with respect to organizational and program performance.

Appendix C

In completing these audits, we collect and analyze information about how resources are managed; that is, how they are acquired and how they are used. We also assess whether legislators and the public have been given an adequate explanation of what has been accomplished with the resources provided to government managers.

Focus of Our Work

A performance audit has been described as:

...the independent, objective assessment of the fairness of management's representations on organizational and program performance, or the assessment of management performance, against criteria, reported to a governing body or others with similar responsibilities.

This definition recognizes that there are two forms of reporting used in performance auditing. The first—referred to as attestation reporting—is the provision of audit opinions as to the fairness of management's publicly reported accountability information on matters of economy, efficiency and effectiveness. This approach has been used to a very limited degree in British Columbia because the organizations we audit do not yet provide comprehensive accountability reports on their organizational and program performance.

We believe that government reporting along with independent audit is the best way of meeting accountability responsibilities. Consequently, we have been encouraging the use of this model in the British Columbia public sector, and will apply it where comprehensive accountability information on performance is made available by management.

As the performance audits conducted in British Columbia use the second form of reporting—direct reporting—the description that follows explains that model.

Our "direct reporting" performance audits are not designed to question whether government policies are appropriate and effective (that is achieve their intended outcomes). Rather, as directed by the Auditor General Act, these audits assess whether the programs implemented to achieve government policies are being administered economically and efficiently. They also evaluate whether Members of the Legislative Assembly and the public are being provided

with appropriate accountability information about government programs.

When undertaking performance audits, we look for information about results to determine whether government organizations and programs actually provide value for money. If they do not, or if we are unable to assess results directly, we then examine management's processes to determine what problems exist or whether the processes are capable of ensuring that value is received for money spent.

Selecting Audits

All of government, including Crown corporations and other government organizations, are included in the universe we consider when selecting audits. We also may undertake reviews of provincial participation in organizations outside of government if they carry on significant government programs and receive substantial provincial funding.

When selecting the audit subjects we will examine, we base our decision on the significance and interest of an area or topic to our primary clients, the Members of the Legislative Assembly and the public. We consider both the significance and risk in our evaluation. We aim to provide fair, independent assessments of the quality of government administration and to identify opportunities to improve the performance of government. Therefore, we do not focus exclusively on areas of high risk or known problems.

We select for audit either programs or functions administered by a specific ministry or government organization, or cross-government programs or functions that apply to many government entities. A large number of such programs and functions exist throughout government. We examine the larger and more significant of these on a cyclical basis.

Our view is that, in the absence of comprehensive accountability information being made available by government, performance audits using the direct reporting approach should be undertaken on a five- to six- year cycle so that Members of the Legislative Assembly and the public receive assessments of all significant government operations over a reasonable time period. We strive to achieve this schedule, but it is affected by the availability of time and resources.

Appendix C

Planning and Conducting Audits

A performance audit comprises four phases—preliminary study, planning, conducting and reporting. The core values of the Office—independence, due care and public trust—are inherent in all aspects of the audit work.

Preliminary Study

Before an audit starts, we undertake a preliminary study to identify issues and gather sufficient information to decide whether an audit is warranted.

At this time, we also determine the audit team. The audit team must be made up of individuals who have the knowledge and competence necessary to carry out the particular audit. In most cases, we use our own professionals, who have training and experience in a variety of fields. As well, we often supplement the knowledge and competence of our staff by engaging one or more consultants to be part of the audit team.

In examining a particular aspect of an organization to audit, auditors can look either at results, to assess whether value for money is actually achieved, or at management's processes, to determine whether those processes should ensure that value is received for money spent. Neither approach alone can answer all the questions of legislators and the public, particularly if problems are found during the audit. We therefore try to combine both approaches wherever we can. However, because acceptable results-oriented information and criteria are often not available, our performance audits frequently concentrate on management's processes for achieving value for money.

If a preliminary study does not lead to an audit, the results of the study may still be reported to the Legislature.

Planning

In the planning phase, the key tasks are to develop audit criteria—"standards of performance"—and an audit plan outlining how the audit team will obtain the information necessary to assess the organization's performance against the criteria. In establishing the criteria, we do not expect theoretical perfection from public sector managers; rather, we reflect what we believe to be the reasonable expectations of legislators and the public.

Appendix C

Conducting

The conducting phase of the audit involves gathering, analyzing and synthesizing information to assess the organization's performance against the audit criteria. We use a variety of techniques to obtain such information, including surveys, and questionnaires, interviews and document reviews.

Reporting Audits

We discuss the draft report with the organization's representatives and consider their comments before the report is formally issued to the Legislative Assembly. In writing the audit report, we ensure that recommendations are significant, practical and specific, but not so specific as to infringe on management's responsibility for managing. The final report is tabled in the Legislative Assembly and referred to the Public Accounts Committee, where it serves as a basis for the Committee's deliberations.

Reports on performance audits are published throughout the year as they are completed, and tabled in the Legislature at the earliest opportunity. We report our audit findings in two parts: an Auditor General's Comments section and a more detailed report. The overall conclusion constitutes the Auditor General's independent assessment of how well the organization has met performance expectations. The more detailed report provides background information and a description of what we found. When appropriate, we also make recommendations as to how the issues identified may be remedied.

It takes time to implement the recommendations that arise from performance audits. Consequently, when management first responds to an audit report, it is often only able to indicate its intention to resolve the matters raised, rather than to describe exactly what it plans to do.

Without further information, however, legislators and the public would not be aware of the nature, extent, and results of management's remedial actions. Therefore, we publish updates of management's responses to the performance audits. In addition, when it is useful to do so, we will conduct follow-up audits. The results of these are also reported to the Legislature.

Appendix D: Office of the Auditor General: 2006/07 Reports Issued to Date

Report 1 – April 2006

Strengthening Public Accountability: A Journey on a Road that Never Ends

Report 2 – September 2006

The 2010 Olympic and Paralympic Winter Games: Review of Estimates Related to the Province's Commitments

Report 3 – November 2006

Audit of Treaty Negotiations in British Columbia: An Assessment of the Effectiveness of British Columbia's Management and Administrative Processes

Report 4 – December 2006

Province of British Columbia Audit Committees: Doing the Right Things

Report 5 – December 2006

Audit of Government's Corporate Accounting System: Part 2

Report 6 – December 2006

Monitoring Government's Finance Province of British Columbia

Report 7 – December 2006

Government's Post-secondary Expansion — 25,000 Seats by 2010

Report 8 – December 2006

Changing Course — A New Direction for British Columbia's Coastal Ferry System: A Review of the Transformation of BC Ferries

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Report 9 – January 2007

Seeking Best Practices in Financial Reporting: Report on the Province's 2005/06 Public Accounts

Report 10 – February 2007

Follow-up of 2004/2005 Report 2: In Sickness and in Health: Healthy Workplaces for British Columbia's Health Care Workers

Report 11 – March 2007

Infection Control: Essential for a Healthy British Columbia
The Provincial Overview

This report and others are available on our website at:
http://www.bcauditor.com